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The OIL AND GAS JOURNAL

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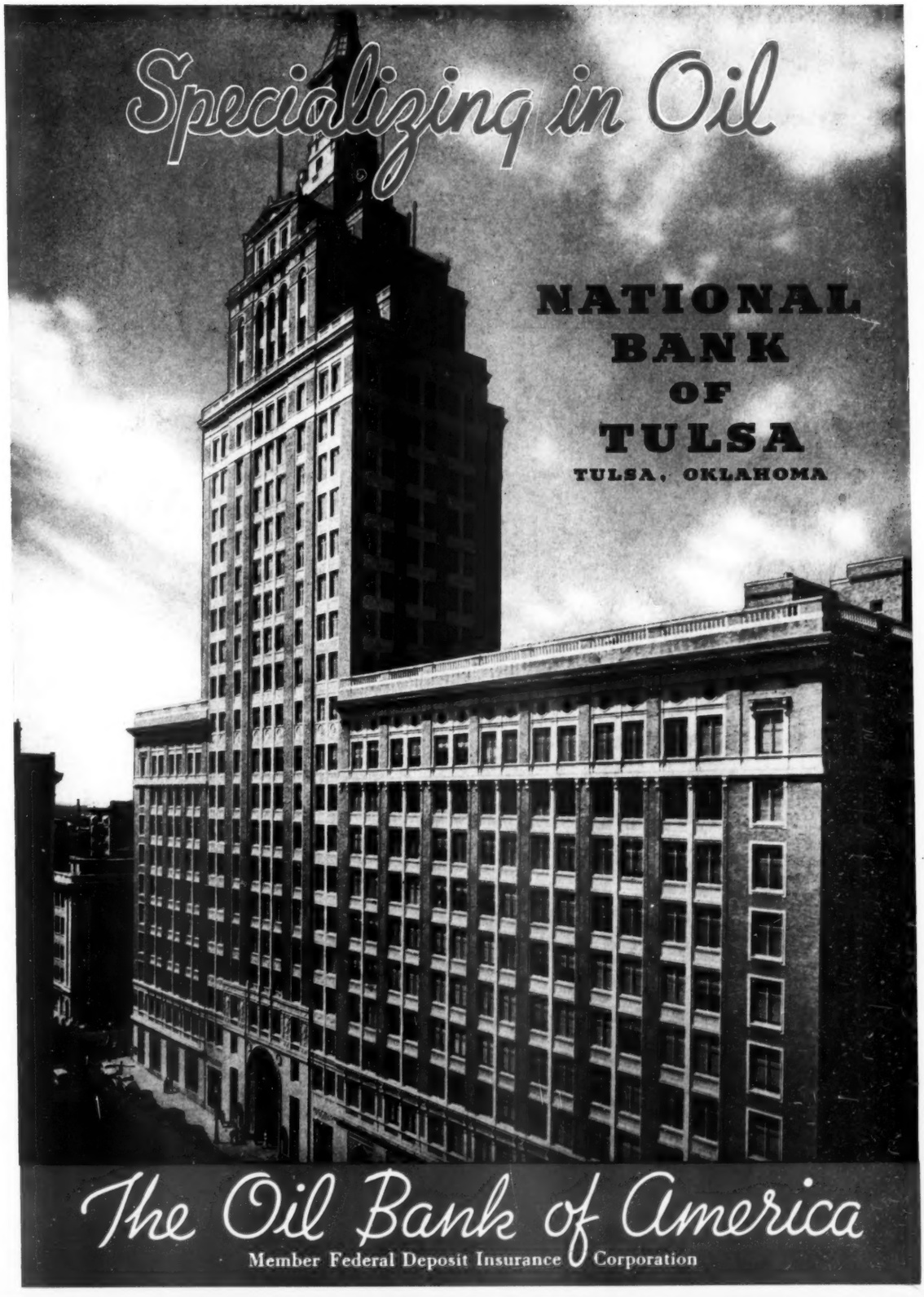

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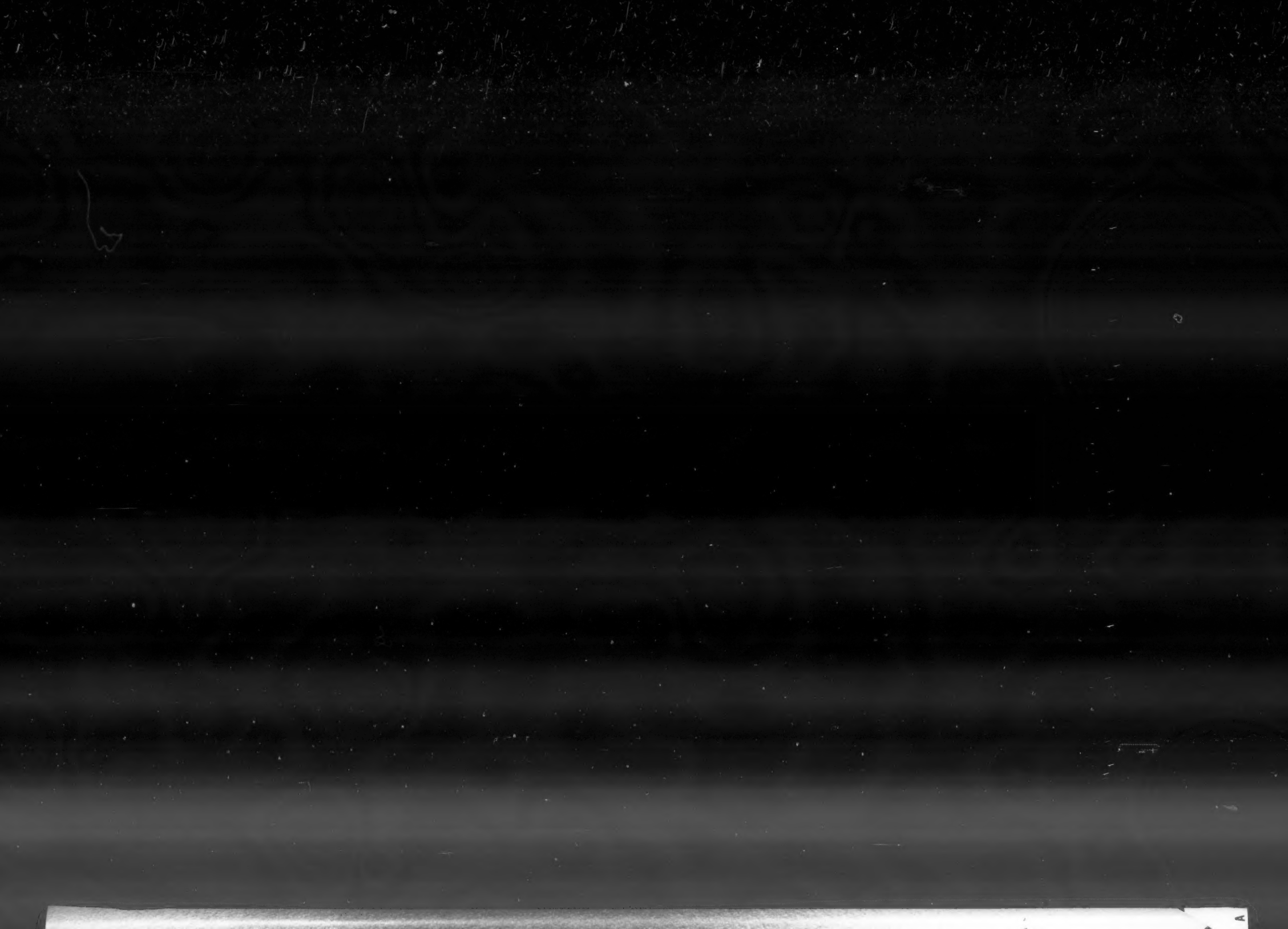

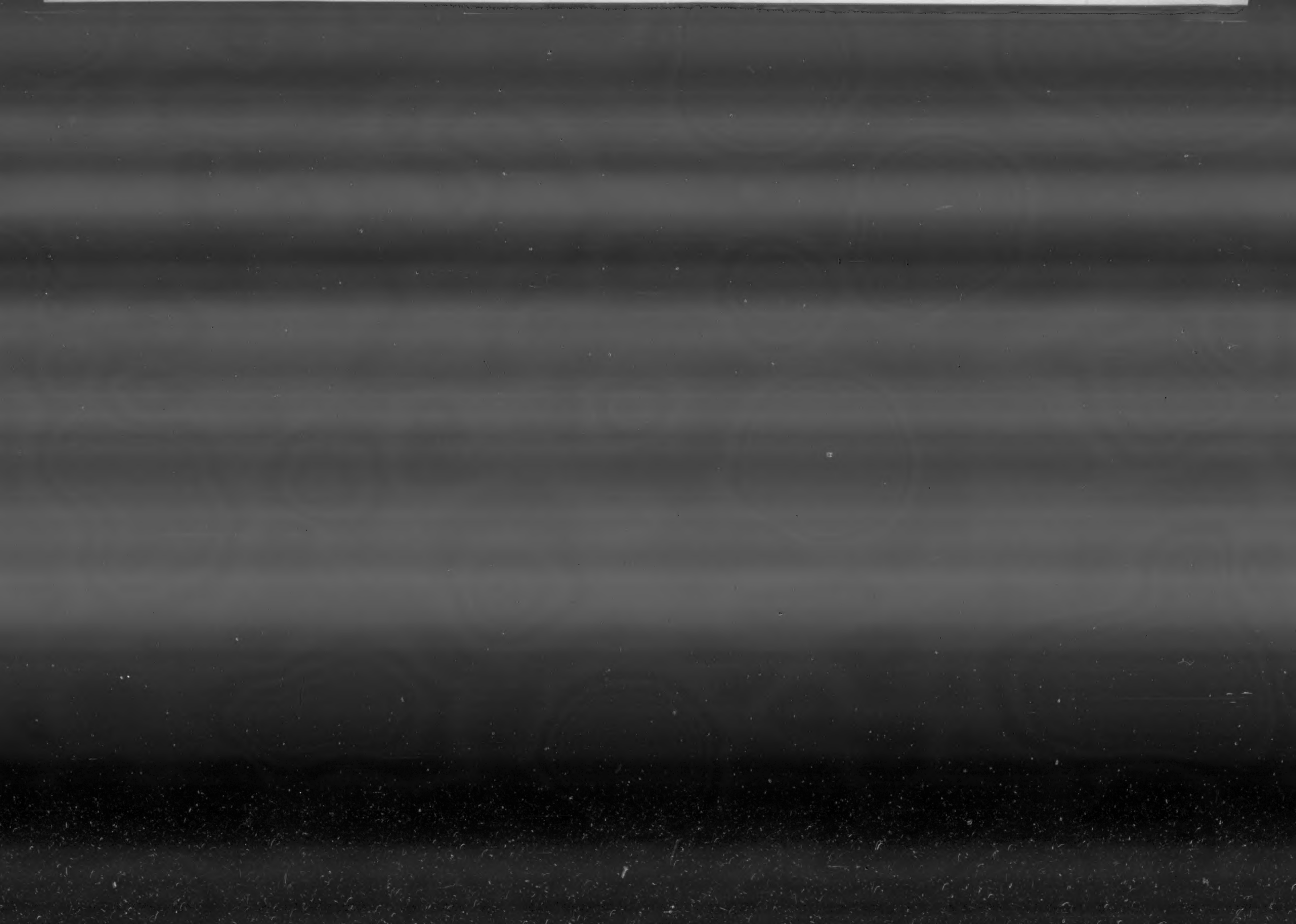

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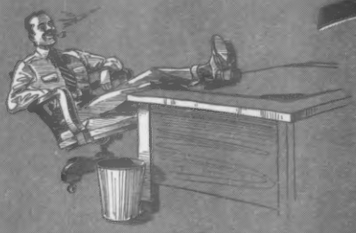

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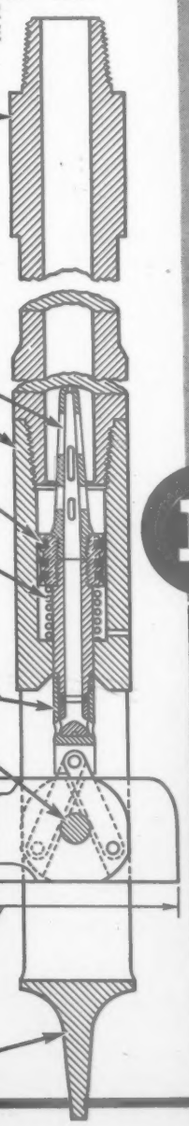

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(5) ***Plunger Spring***—Strong Plunger Spring insures blades properly closing.

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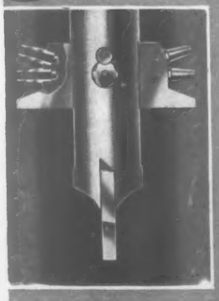

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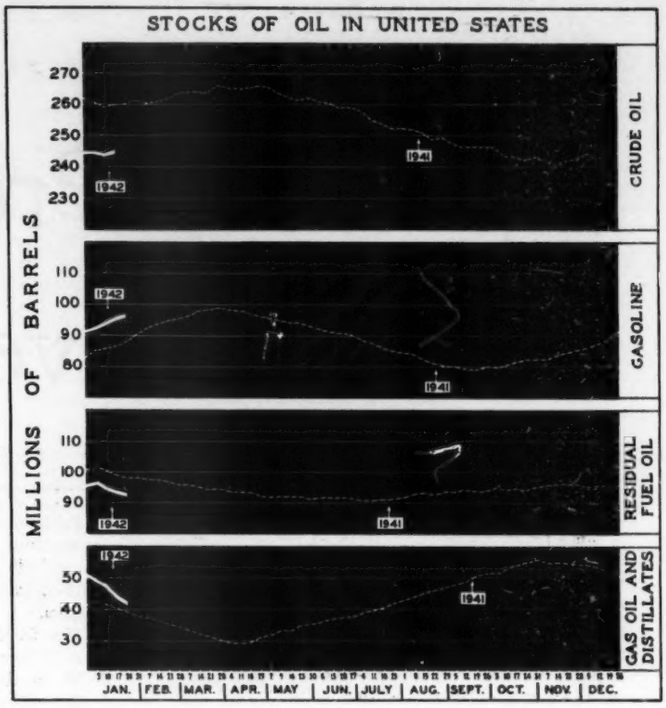
Trends

Complaints Made Regarding Changes In Market Outlets



THERE was additional evidence the past week of the inevitable reactions when substantial changes are made in the industry's operating schedules. The latest development has to do with the changes in allocations of state markets which have been made effective by the Office of Petroleum Coordinator. The first results of these changes were apparent in January when OPC took over these monthly allocations which for several years were based on estimated demands compiled by the Bureau of Mines. While OPC has not made an official explanation of the basis for the changes in allocations, it is known that officials take into account the proven reserve position of the states, flush production, stocks, the availability of markets and any other factors which the Washington agency believes should be evaluated during the war emergency.

CRUDE PRODUCTION *4,321,455 bbl. daily average — up 277,215 bbl. One year ago 3,590,340 bbl.*

CRUDE STOCKS *246,267,000 bbl. as of January 17—up 1,903,000 bbl. One year ago 259,934,000 bbl.*

GASOLINE STOCKS *96,363,000 bbl. as of January 24 — up 746,000 bbl. One year ago 88,302,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *92,079,000 bbl. as of January 24 — down 624,000 bbl. One year ago 98,178,000 bbl.*

GAS OIL AND DISTILLATES *41,863,000 bbl. as of January 24—down 2,121,000 bbl. One year ago 39,415,000 bbl.*

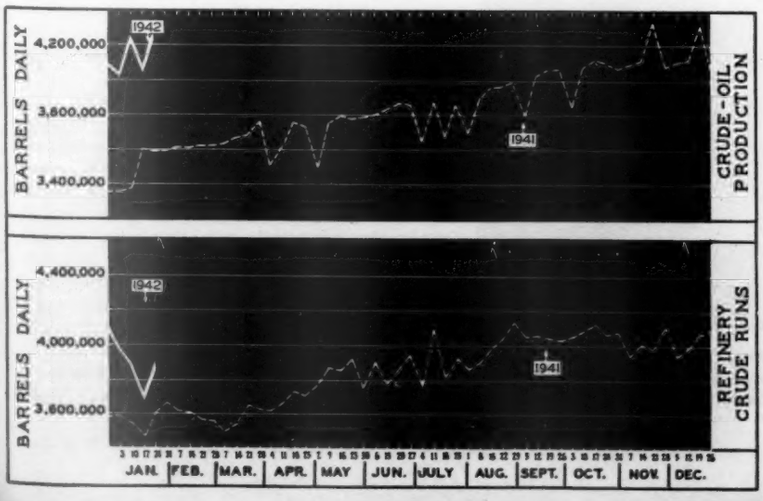
REFINERY RUNS *3,885,000 bbl. daily week ended January 24 — up 162,000 bbl. One year ago 3,605,000 bbl.*

Oklahoma and Illinois have been the principal sufferers under the new arrangement, and Texas the major beneficiary. In December, before OPC took over the allocation duty, Oklahoma was given 11.1 per cent of the total market for crude oil. In February its share will be 9.6 per cent, involving a reduction of 65,000 bbl. daily in the state's production. If this allocation is made effective next month several of the state's 25 refineries will be forced to curtail their plant operations. Owners of stripper wells which provide a large part of the state's crude-oil production, are also complaining that reduced allowables will make it impossible to continue the operations of many leases due to the reduced revenue. The major crude-oil buyers are affected although their situation is less serious because in most cases they are in position to shift their pipe-line operations and purchase supplies elsewhere. The situation in Illinois is comparable to that of Oklahoma. That state's share of the market dropped from 10.3 per cent in December to 9 per cent in February, bringing a decline of 54,700 bbl. daily in the state's production. While decreases in Illinois' output were expected due to reduction in flush production of new fields, there have been complaints from operators of small refineries that the Government's program has worked an unwarranted hardship.

The gains in Texas markets have about offset the losses in Oklahoma and Illinois. The Lone Star State had 35.7 per cent of the crude market in December based on the B. of M.'s recommendation and has been given 38.9 per cent of the market for February by OPC, a gain of 116,300 bbl. daily. Officials and many operators in that state have contended for some time that they were not receiving their proper share of the total market. OPC officials have not indicated what action if any will be taken in this matter.

DAILY AVERAGE PRODUCTION FOR WEEK

	Jan. 24, 1942	January OPC recommended production	January state allowables	Jan. 17, 1942
Arkansas	74,150	73,700	75,689	73,345
California	650,750	646,200	646,200	633,750
Eastern fields	110,200	113,100	.....	108,900
Illinois	367,160	386,400	.....	337,570
Kansas	254,200	259,900	259,900	254,850
Louisiana	366,380	329,300	361,111	361,525
North Louisiana	*82,730*	.....	.....	*81,825*
Louisiana Gulf Coast	*283,650*	.....	.....	*279,700*
Michigan	48,200	47,400	47,400	50,600
Mississippi	74,989	60,400	.....	72,915
Nebraska	5,200	5,600	.....	5,150
New Mexico	119,975	121,200	121,200	120,450
Oklahoma	417,150	415,700	425,000	415,925
Rocky Mountain states	107,500	106,000	.....	107,460
Texas	1,725,600	1,573,500	1,620,659	1,501,800
East Texas	*439,800*	.....	.....	*368,900*
West Texas	*348,500*	.....	.....	*294,500*
North Central Texas	*146,800*	.....	.....	*145,300*
East Central Texas	*93,800*	.....	.....	*88,150*
Texas Panhandle	*91,100*	.....	.....	*87,850*
Texas Gulf Coast	*494,400*	.....	.....	*419,400*
Southwest Texas	*111,200*	.....	.....	*97,700*
Total United States	4,321,454	4,138,400	.....	4,044,240
Total production, Jan. 1-24, 1942			100,416,178 bbl.	
Same period last year			83,265,280 bbl.	



Operators Press for Revisions Of Restrictive Federal Orders

By H. STANLEY NORMAN

Priority assistance for oil companies operating outside the United States is provided in Preference Rating Order P-98-a, issued late last week in Washington.

The foreign priority order permits the use of preference ratings assigned by P-98 to domestic operators.

An operator who wishes to use preference ratings under P-98-a must make application to the OPC and receive authorization, specifying the kinds and quantities of materials to be obtained.

Countersignature of the district representative of the OPC is not required on orders qualifying under P-98-a.

REVISIONS that oil men believe will reduce Conservation Order M-68 and Preference Rating Order P-98 to practical working instruments were recommended this week to the Office of Petroleum Coordinator, the Petroleum Industry Council for National Defense and other federal agencies that may gain audience with the supreme War Production Board. Modifications sought by the rank and file of oil men throughout the country were in close agreement, indicating that objectionable features were common to the entire industry.

There are nearly a dozen points in M-68, P-98 or other federal relations with the oil industry against which operators have directed their most severe criticism. They are:

1. Apparent lack of petroleum representation on the War Production Board's Requirements Division.

2. Provisions of M-68 preventing procurement of repair and maintenance material for producing wells on less than 10 acres, even though they may have been in operation long before the emergency arose and in all instances either producing or drilling before the order was issued.

3. Requirement that all purchase orders be countersigned by the nearest district director for the OPC. They recommend, instead, a periodical report on purchases to district OPC offices.

4. Lack of coordination between OPC district offices and regulatory bodies in the various producing states. Recommendation has been made that district staffs be enlarged to provide men to maintain close collaboration.

5. Inability of the OPC to give prompt and adequate consideration to all applications for exception to the spacing provisions of M-68. Suggested correctives are enlarged district personnel, origination of all spacing exception applications in the district in which the property involved may be located and devotion of attention to the petitions in the order in which they are received in the district offices and at Washington, D. C.

6. Absence of a provision in M-68 for adjustment of allowables to protect wells drilled in conformance with the 40-acre limitation against drainage from offset properties that may have been developed before the order was conceived.

7. Failure to classify recycling plants in Preference Rating Order P-98 along with refineries and natural-gasoline installations. Operators recommend that recycling operations be included with other consumers of equipment who are assigned a priority rating of A-2 for repair and maintenance items and standby stocks necessary to keep present plants in operation.

8. Uncertainty of the petroleum industry over specific requirements, including quantity and quality of petroleum products required by the United States military services, for lend-lease and other foreign commitments. Industry spokesmen have recommended inclusion of liaison representatives of the Navy, the Maritime Commission, the Economic Defense Board, War Production Board and Rubber Reserve Corp., among government observers meeting with the PIC. Gen. Walter B. Pyron, vice president of Gulf Oil Corp., in civilian life, is liaison officer representing the U. S. Army who confers with the OPC and PIC.

9. Exclusion of repair and maintenance items that are classified in operators' books as a fixed asset from preferential treatment. Here, it is pointed out that such materials as tubing valves, pumping units, sucker rods, screen, blank liner, casing and numerous other items are carried on books of many companies as fixed assets, that they are denied preferential parity and that such equipment is essential to operation of a well in order that it can fulfill its proportionate share of the defense program.

Protests Sent Washington

Communications from individual operators, organized oil groups and civic interests in all productive states expressing their grievances were in the hands of the OPC or en route to Washington. The two provisions of P-98 receiving universal appeal for revision are those preventing procurement of equipment for repair and maintenance of producing wells if more densely spaced than one to 10 acres and requiring that purchase orders be countersigned by the district director of OPC.

Robert E. Allen, director of the production division in the Office of Petroleum Coordinator, is rumored to be in line for promotion to the post of assistant deputy

The clause in P-98 requiring countersignature of purchase orders stipulates that such papers must be sent to the nearest district office of the OPC. In the case of some Oklahoma operators, the Houston, Tex., office, headquarters for District 3 is nearer than Chicago. The situation has caused a jam of clerical work in Houston for one thing and, for another, operators are chafing at the delays in conducting routine business. Reports from Washington indicated that the objectionable requirement of obtaining countersignatures may be deleted from P-98, although formal action had not been reported.

Meetings of oil men were held in all operating centers last week including Tulsa, Houston, Columbus, Ohio, and Denver, Colo., for the purpose of obtaining a cross-section of opinions of oil men.

Eastern Operators Meet

After the meeting in Columbus, Ohio, which was attended by Frank Brewster, formerly president of Belmont Quadrangle Drilling Co. and now director of the OPC Natural-Gasoline Division, a committee was appointed to coordinate interests of operators with the conservation and equipment orders. A subcommittee composed of J. A. Upham, Upham Gas Co., Mount Vernon; Walter Locker, president of the Ohio Independent Gas Producers Association; J. J. Schmidt, East Ohio Gas Co., Cleveland; W. E. Ferguson, Ohio Fuel Gas Co., Columbus, and Phillip Faine, secretary of the Gas Producers Association, is to draft recommendations for modification of M-68. The subcommittee's findings will be presented at a meeting of the District 1 production committee at Pittsburgh, Pa., January 30 and 31.

Lack of cleancut understanding within state regulatory bodies about federal policy of granting exceptions to the spacing rule in M-68 led to confusion in all quarters. Some of the commission are issuing drilling permits contingent upon the applicant's success in his petition for an exception to the M-68 spacing rules. Other regulatory bodies are issuing drilling permits only if the application conforms to the 40-acre pattern for oil wells and 640 acres in the case of gas areas. Still others are honoring drilling applications on the basis of state rules and leaving it up to the operator to qualify under federal regulations.

Uncertainties and absence of a uniform policy have precipitated a sharp reduction in drilling permits within most states. During the most recent week reported in Texas, 13 new drilling permits were issued by the Railroad Commission, the lowest figure prevailing in that state in many years. Belief is general that drilling operations will make up for the few weeks of reduced activity, when and if, restrictions are modified as most OPC representatives have hinted will be forthcoming.

Field-wide exceptions to the spacing limitations of M-68 are urged by operators in some of the

low-yield, low-pressure districts, those that produce from multiple sands and particularly in piercement-type salt domes along the Gulf Coast of Texas and Louisiana. Operators have argued that observance of 40-acre spacing in some of the piercement-type domes would soon, perhaps immediately, carry subsequent locations beyond the productive limits of the structures. Frequently, operators contend in their representations to OPC, completion of a single well in more than one pay zone is counter to sound producing practices and opposed to conservative engineering.

George A. Hill, Jr., chairman of the production committee for OPC in District 3, presided over a session of his group a week ago in Houston, Tex., and prepared list of seven resolutions and two specific recommendations dealing with most of the problems that also have received consideration at similar meetings in Tulsa, Los Angeles, Denver, Columbus and other oil cities.

Protests on P-98 Likely To Bring Modifications

By HENRY D. RALPH

WASHINGTON, D. C., Jan. 26.—Complaints of the oil industry over the terms of Priorities Order P-98 are echoing loudly through Washington's corridors, and something will be done about it.

Just what action will be taken remains to be seen, but officials of OPC and the Priorities Division of the new War Production Board (nee OPM) have been conferring on complaints and they promise changes very shortly.

Present indications are that P-98 will be amended to eliminate the present requirement that field offices of OPC must endorse orders for material in order to obtain the designated preference ratings for various purposes. This requirement has caused more protests than any other provision of P-98. Operators in other industries can originate preference ratings for essential repair and maintenance parts on their own affidavits, and no valid reason has been advanced for subjecting the oil industry to the added delay, expense and regulation of securing the endorsement of an OPC field office. P-98 was written jointly by OPC and the Priorities Division, but no one will admit parentage of the endorsement requirement. Most OPC officials favor deletion of that provision.

The new Materials Division of OPC is appointing district directors in the five field offices. Operators may be required to file periodic statements of inventories and materials obtained and used under P-98, even though countersigning provisions are deleted.

Knowlton May Get Job

Rumors in Washington suggest a number of changes in the organization of the OPC. One report is that Robert E. Allen will be promoted from director of the Production Division to assistant deputy coordinator. A new director will be chosen from the present staff of the Production Division.

D. R. Knowlton, production manager of the Phillips Petroleum Co., Bartlesville, Okla., has been occupying a desk in the Production Division for several weeks, but the OPC personnel office denies that he is on the staff. Guessing is that Mr. Knowlton may be understudying Mr. Allen for the job of director of the Production Division.

Another rumor is that the OPC may set up a sixth administrative region and district office to include the heart of the Mid-Continent fields.

Outside the category of rumor but still not yet in the area of positive news, is the knowledge that the General Land Office and other units of the Department of the Interior are studying the subject of reducing oil royalties on public oil lands and other measures to increase discoveries in the federal land states. To date no decisions have been reached on this subject.

The department has been giving much study to plans for developing mineral resources of all kinds needed in carrying on the war, and has had considerable correspondence with senators and representatives from western states. It is also organizing a departmental War Resources Council to formulate and promote plans for mineral development, and some announcements on this subject are expected shortly.

Nelson to Retain Coordinator Ickes

WASHINGTON, D. C., Jan. 27.—Creation of the War Production Board, headed by Donald M. Nelson, apparently will have little immediate effect on regulation of the oil industry. Mr. Nelson said that at present he sees no reason for changing the relationship with the Office of Petroleum Coordinator and that he would consider Secretary Ickes his industry branch chief for the oil industry.

The Office of Production Management as such has been abolished but the bulk of its personnel continues as the staff of the WPB, at least during what Mr. Nelson described as an interim organization.

Priorities will come under the new Division of Industry Operations. Considerable change may be made in the operation of the priorities system before long, but for the present all orders of the OPM's Priorities Division remain in force.

The priorities program will be in charge of C. H. Matthiessen, Jr., formerly with the Hawaiian Pineapple Co., who has been serving as assistant deputy director of priorities.

Regular Tank Cars May Be Converted

WASHINGTON, D. C., Jan. 27.—Conversion of ordinary tank cars from the normal function of transporting low vapor pressure products to movement of liquefied gases, under pressure, such as isobutane is being considered by the Office of Petroleum Coordinator.

Exploration of the feasibility of using tank cars designed to haul regular motor fuel or lower pressure petroleum products indicates that components of 100-octane gasoline will be concentrated at refining plants rather than take the installations to the raw material.

Part of the demand for cars can be met by eliminating cross hauls and back hauls. Consideration is being given to a general reclassification of tank cars on the theory that most of those in service are capable of withstanding more severe pressures than applied in normal transportation. Preliminary investigation indicates that insulated asphalt or road-oil cars may be converted to transportation of natural gasoline, and, in turn, natural-gasoline cars may be used for moving butane and possibly butadiene.

Three companies have been designated by the OPC to make conclusive tests before conversion plans are made operative. From each of several classifications, cars will be selected with tanks which are sufficiently heavy to permit higher safety-valve settings and on these install the necessary fittings and safety devices needed to make them suitable for handling butane. Service experiments will be made and if successful, general conversion orders may follow.

At present, there are about 1,200 cars in the liquefied gas service. There are about 1,800 other cars which meet the rigid requirements but they are in other essential services, hauling chlorine, anhydrous ammonia, sulfur dioxide, and other essential commodities.

Tank-Car Shipments Show Sharp Increase

WASHINGTON, D. C., Jan. 22.—Quick response to request by Deputy Petroleum Coordinator Ralph K. Davies for greater use of railroad tank cars in moving oil to the Pacific Northwest and the Atlantic seaboard states was evident in the report of rail movement of petroleum last week.

OPC reported that 2,410 cars of petroleum and petroleum products had been shipped into the Atlantic seaboard territory during the week ended January 17. This compared with 1,827 cars the previous week and represented an average daily movement of 344 cars compared with 261 the preceding week.

The fluctuation in tank-car shipments is shown in the following tabulation of East Coast receipts in number of tank cars per week for the weeks ended on the dates noted:

Week ended—	No. cars	Week ended—	No. cars
Jan. 17, 1942	2,410	Nov. 15	3,756
Jan. 10	1,827	Nov. 8	3,932
Jan. 3	2,005	Nov. 1	4,094
Dec. 27, 1941	1,897	Oct. 25	4,046
Dec. 20	1,743	Oct. 18	4,396
Dec. 13	1,863	Oct. 11	4,322
Dec. 6	2,181	Oct. 4	4,099
Nov. 29	3,065	Sept. 27	3,135
Nov. 22	3,113		

Oil Men of District 3 Collect Scrap Metal

FORT WORTH, Tex., Jan. 26.—Charles F. Roeser of Fort Worth, Tex., general chairman for District 3 of the Office of Petroleum Coordinator, has been named chairman of the Texas Mid-Continent Oil and Gas Association drive for collection of scrap metal and rubber in the oil industry. Mr. Roeser, in accepting the chairmanship, extended the drive to cover not only Texas, but also all other states of District 3, including Louisiana, New Mexico, Arkansas, Mississippi and Alabama.

"I am enlarging our drive to cover all six states of District 3," Mr. Roeser said, "and am asking the Texas Mid-Continent to coordinate the campaign over this entire area through its affiliated organizations."

The collection of oil-field scrap iron, steel, aluminum and rubber was undertaken by the association at the request of the federal Government through its Bureau of Industrial Conservation.

Acme

THIS ONE GOT AWAY. THE GULF OIL CORP. TANKER MALAY, HER PLATES RIPPED AND LIMPING FROM OTHER HITS BY TORPEDOES AND SUBMARINE DECK-GUN SHOTS, MANAGED TO MAKE PORT AT NEWPORT NEWS, VA. TWO OF THE CREW WERE LOST IN ANOTHER ATTACK ON COASTWISE OIL MOVEMENT WHICH IS CONTINUING. FIVE TANKERS HAVE BEEN SUNK.

This Week...

Retention of Secretary Ickes as head of the petroleum industrial branch of the War Production Board was indicated by Donald M. Nelson as his supreme organization began to take shape.

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Robert E. Allen, so Washington rumors have it, is slated for promotion to assistant deputy coordinator, vacating his post with the OPC as director of production.

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Protests swamp Washington, D. C., office of the OPC against certain provisions of Conservation Order M-68 and Preference Rating Order P-98. Most distasteful to operators are requirements that purchase orders must be countersigned by district OPC directors, denial of repair and maintenance materials, except by special permission, for thousands of wells vital to war program on less than 10 acres. District functional committees, other organized groups, individuals passed resolutions and wrote letters petitioning for relief.

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The OPC hinted that relief from objectionable features of M-68 and P-98 may be modified, gave no specific promises.

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Priority assistance was provided for foreign operating companies on the same basis as extended to domestic concerns under P-98. Pertinent deletion from the foreign order P-98-a is the requirement that purchase orders must be signed by nearest district director of the OPC.

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The Oil and Gas Journal's tabulation of crude-oil reserves as of January 1 totaled 20,299,542,000 bbl., an increase of 200,285,000 bbl. compared to a year ago. Record production of 1,391,544,457 bbl. of crude was registered.

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Investigation ordered to determine practicality of converting natural-gasoline cars to service of transporting butane, isobutane and other higher vapor-pressure hydrocarbons.

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Texas' crude production of 1,596,000 bbl. daily authorized by the OPC in February, an increase of 22,500 bbl. Oklahoma, California, Illinois and Kansas received deep cuts.

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Shell's refinery at Balik Papan and producing fields in the vicinity on the east coast of Borneo were destroyed by Dutch demolition squads acting on military orders. Decommissioned was a 41,250-bbl. refinery.

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February demand for motor fuel estimated by the Bureau of Mines at 47,700,000 bbl., an increase of 10 per cent over the actual in the same month last year.

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The OPM, federal officials declared, will continue to exist in a legal sense until an order abolishing it is issued and controls imposed by it are officially transferred to the jurisdiction of the WPB.

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Manufacture of civilian passenger cars and light trucks prohibited after February 1. Vehicles in hands of distributors and dealers, frozen there since January 1, will go to military services.

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Coordinator Ickes certified production quotas to the 20 oil states totaling 4,101,800 bbl. daily for February, a reduction of 36,600 bbl. from January. Quotas in five states were raised, lowered in others.

OPC Wants Oil Industry to Dominate Rubber Program

RUBBER shortage was having a greater effect on the oil industry last week than any other United States business except rubber itself. Like all other industries and the general public, oil men were having to adjust their activities to the use of fewer tires, less rubber goods of all kinds.

Since the bulk of the raw materials for the buna-type synthetic comes from petroleum, the Office of Petroleum Coordinator was said to be urging Federal Loan Administrator Jesse Jones to use most of his $400,000,000 synthetic-rubber-expansion money to help the oil industry build synthetic-rubber manufacturing plants.

OPC wanted the oil industry to dominate the new synthetic-rubber industry because: (1) It believed synthetic rubber should be manufactured in plants near the supply of raw materials (butadiene and styrene); and (2) it believed the oil industry should have some control over the outlet for synthetics after the war when natural rubber would again be available. Without such control, oil companies, said OPC, might be left without a market.

Pending completion of a synthetic-rubber program, whether dominated by oil or rubber, all industries were making a recheck of ways and means to conserve the existing supply of rubber products.

Some idea of what rubber products would still be available in limited quantities was given by the War Production Board which issued a new amendment to the conservation order. It listed in detail the products for which crude rubber and latex might be used and the amounts available for each. While the over-all effect was to reduce the amount of crude rubber and latex available to manufacturers by about 75 per cent of what they have been getting, the amounts available for the manufacture of some products was increased.

Among the quotas for products used in the oil industry and the percentages of 1941 production to be allowed were: Essential heavy industry belting, hose and packings, 140 per cent; fire and mill hose essential for civilian defense and increased industrial activity, 180 per cent; rubber footwear for workmen, 30 per cent; tire-repair materials, 100 per cent; industrial V-belts and belting, 120 per cent.

Outlook and Review Issue Features . . . .

● Annual section starts on Page 60 of this issue, with the Journal's estimate of proven reserves, and report of new discoveries and reserves. The section contains an exclusive statement by Petroleum Coordinator Ickes, views of several of the industry's operators, a pictorial section of Oil in War, and the reviews of activity which make this issue an invaluable reference encyclopedia to the industry.

Du Pont Predicts Large 1942 Synthetic Output

PHILADELPHIA, Pa. Jan. 26.—Government and industry will be producing approximately 75,000 tons of synthetic rubber by the end of 1942, an official of the E. I. Du Pont de Nemours & Co. predicted.

Less than 12,000 tons—only 1.5 per cent of the nation's crude rubber consumption—were turned out in the United States last year, E. R. Bridgewater, manager of the company's rubber chemical division, said in an address prepared for the annual meeting of the Franklin Institute.

Most of the increase will be brought about by government-owned plants, which he estimated would be capable of producing 40,000 tons by the end of 1942. Private-owned plants are to boost their synthetic rubber output to 35,000 tons.

Dow Named to Conference

WITH the appointment of Hiram M. Dow, of Roswell, N. M., as a member representing the Interstate Oil Compact Commission, the formation of the National Conference of Regulatory Bodies authorized by Petroleum Coordinator Ickes, is nearing completion. Mr. Dow, a former lieutenant governor of New Mexico and who has been active in conservation work in that state for several years, was appointed by Gov. Leon C. Phillips, of Oklahoma, chairman of the Interstate Oil Compact Commission at a meeting last week of the commission's executive committee in Oklahoma City, Okla.

Other members of the conference which is expected to hold its first meeting with OPC officials in Washington, D. C., in early February are O. C. Bailey, chairman, Arkansas Oil and Gas Commission; Warwick M. Downing, chairman of Colorado Gas Conservation Commission; R. M. Medill, director, Department of Mines and Minerals in Illinois; Andrew F. Schoeppel, chairman, Kansas Corporation Commission; Joseph L. McHugh, state conservation commissioner, Louisiana; P. J. Hoffmaster, director of conservation, Michigan; John Kelly, secretary, Oil and Gas Commission of New Mexico; Reford Bond, chairman, Oklahoma Corporation Commission, and Jerry Sadler, member, Texas Railroad Commission.

Other oil states do not have regulatory bodies and it is not expected that appointments will be made from them to the conference. The conference body was requested by Mr. Ikes to bring about greater cooperation between the state regulatory authorities and OPC.

At the first meeting of the executive committee of the Interstate Oil Compact Commission a financial plan was agreed upon to receive and administer contributions from the several states which this year will participate in the support of the commission's activities. The next meeting of the executive committee will be held at Oklahoma City, February 23. Members present at last week's meeting were Governor Phillips; J. C. Hunter, Texas; Hiram M. Dow, New Mexico; Andrew F. Schoeppel, Kansas; and J. H. Alphin, Arkansas.

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Dahlgren Technical Secretary Of Compact Research Committee

E. G. Dahlgren, who has been a member of the production staff of OPC with headquarters at Washington, D. C., for several months, has accepted the appointment of technical secretary of the Research and Coordinating Committee of the Interstate Oil Compact Commission. He expects to take over the duties of the office about February 1 at the commission's headquarters, State Capitol Building, Oklahoma City, Okla. Members of the recently appointed Research and Coordinating Committee held their first meeting at Oklahoma City last week. The following were present: L. B. Taylor, Kansas; John Kelly, New Mexico; Dan O. Howard, Oklahoma, and J. W. Sanders, Arkansas. E. L. De Golyer, director of conservation of the OPC, attended the meeting representing the federal Government as provided for in the revised bylaws of the Interstate Oil Compact Commission.

E. G. DAHLGREN

"Ty" Dahlgren has been connected with oil operations since his graduation from the University of Wisconsin in 1929. He was engaged in conservation work in Oklahoma from 1931 to 1937 as an engineer for the Oklahoma City Producing Association and later the Oklahoma Corporation Commission. He resigned in June 1937 to take charge of the oil conservation department of the Kansas Corporation Commission. He resigned in 1939 and was employed as an oil and gas valuation engineer by the Securities and Exchange Commission. He joined the staff of OPC last summer.

Tulsa Company Acquires Braden Steel Ownership

Ownership of the Braden Steel Corp., Tulsa, has been acquired by the Moorlane Co., supply firm, also of Tulsa, it was announced by William D. Moorer, president of the Moorlane Co.

Braden Steel was originally a Tulsa owned concern, but in the past few years has been operated as an estate by the Colonial Trust Co. of Pittsburgh, Pa. Its entire personnel, amounting to about 50 employes, will be retained according to Mr. Moorer, and it will continue to operate as a separate firm.

Mr. Moorer, however, is president, and S. D. Hunt, vice president, and H. S. Medlin, secretary-treasurer of both companies. L. T. True is assistant treasurer of the Braden corporation and James C. Pharr, assistant secretary.

Mr. Moorer said the transaction would result in enlarged operations of the Braden firm which has been engaged in war production.

Texas Company War-Plant Outlay May Total $30,000,000

HOUSTON, Tex.—Texas Co.'s expenditures for refining facilities directly related to the war program will total between $25,000,000 and $30,000,000, W. S. S. Rodgers, president, declared here last week while on tour of company properties. He was accompanied by a number of directors and officers on the inspection trip that started in New Orleans and ended at Lawrenceville, Ill.

In addition to the 100-octane gasoline expansion programs at three of the Texas Co.'s refineries, announced last week, Mr. Rodgers said that a large sum will be spent on construction of toluene manufacturing facilities and on equipment for recovery and preparation of base stocks for aviation fuel.

DEATHS

J. D. COLLETT, 72, president of O'Keefe & Collett Corp., Fort Worth, Tex., and long active in the oil business, died January 22 after a prolonged illness. Mr. Collett went to Beaumont more than 40 years ago and became an independent oil operator in the Spindletop boom. He was president of the Mid-Continent Oil and Gas Association from 1933 until December 1938, when he was made chairman of the general association. He had been a director of the American Petroleum Institute. His widow and a son survive.

BERT S. RIDGEWAY, 42, district geologist in Illinois and Indiana for Cities Service Oil Co., died last week in Mattoon, Ill., following a heart attack. His widow and a son survive.

THOMAS JEFFERSON REDD, independent operator of Tulsa, died at his home last week of a heart ailment. A native of Pennsylvania, Mr. Redd followed the play westward into Nowata, Okla., in 1911. In 1914 he came to Tulsa and continued his oil operations from this city. He is survived by his widow and a daughter.

E. R. BROWN, 73, chairman of the board of Magnolia Petroleum Co., and director of Socony-Vacuum Oil Co., Inc., died January 25 in New York City. Mr. Brown had been associated with the petroleum industry in the Southwest practically from its inception. He left Olean, N. Y., for Corsicana, Tex., in 1897. There he directed the construction of the first refinery in the Southwest. He went to Dallas from Corsicana in 1914. Ten years later he became president of Magnolia Petroleum Co., and in 1925 was made a vice president and director of the Socony-Vacuum company.

CHESTER A. EVERTS, 51, a Texas oil man for more than 20 years, died January 20 in Rochester, Minn. Mr. Everts was owner of Everts Drilling Co., and was vice president of the East Texas Oil Association.

DEWEY S. KELLY, 43, employe of the Mid-Continent Petroleum Corp., Tulsa, died January 25 at his home in Tulsa, following a stroke. The widow, two daughters and a son survive.

JAMES WILLIAM COIT, mayor of Bradford, Pa., and former oil man, died last week in a Bradford hospital. Death followed a 3-week illness. Mr. Coit was born in Richburg, N. Y., in 1882, his family moving to Bradford 2 years later during the early days of the Bradford oil excitement.

BERT A. HARE, 67, senior member of the firm of Hare, Anderson & Hare, drilling contractors, died at his home near Limestone, N. Y., last week. He had been in ill health for the past year. Mr. Hare had been engaged in the oil business all his adult life.

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THE MARKETS*

CRUDE OIL: Reductions ordered in February in the production of crude from most states indicate that this market will continue tight. Production quotas are claimed to be below refinery demand in some local areas. Completion of the U. S. Tariff Commission survey of petroleum-production costs is awaited to determine the 1942 course of prices.

REFINERY PRODUCTS: Increasing stocks of gasoline, slowing up of coastwise movement and curtailed consumption have eased the buying pressure on motor fuel. Tank-car prices were advanced 0.3 cent in eastern states by permission of the Office of Price Administration.

TANK-WAGON AND POSTED DEALER: This market moved up 0.3 cent along with other base motor-fuel prices in the eastern states, effective January 23. Prices in this market in other parts of the country are static.

FINANCIAL: Oil securities traded over a narrow range. Average of 30 representative stocks for week ended January 24: High, 23.84; low, 23.06; close, 23.50. Week ended January 17: High, 24.00; low, 22.61; close, 23.49.

*Additional information in the market section.

STATE CAPITALS...

Production Rate for Fifteen States Reduced by OPC

WASHINGTON, D. C., Jan. 27.—Protests from numerous producing states are being received in Washington against the daily crude-oil quotas recommended by the Office of Petroleum Coordinator for February. A reduction of 36,600 bbl. in the nation's daily production was recommended. Fifteen of the producing states suffered reductions topped by a recommended cut of 20,400 bbl. in Oklahoma's daily output.

Other major reductions were: Illinois, 14,600 bbl.; California, 13,900 bbl.; Kansas, 8,200 bbl., and Louisiana, 5,700 bbl. daily.

The production assigned states for February, January and the changes follow:

RECOMMENDED PRODUCTION RATES

State—	Feb. 1942	Jan. 1942	Changes
Texas	1,596,000	1,573,500	+22,500
California	632,300	646,200	—13,900
Oklahoma	395,300	415,700	—20,400
Illinois	371,800	386,400	—14,600
Louisiana	335,000	329,300	—5,700
Kansas	251,700	259,900	—8,200
New Mexico	119,300	121,200	—1,900
Wyoming	78,000	78,600	—600
Arkansas	74,500	73,700	+800
Mississippi	57,400	60,400	—3,000
Pennsylvania	48,000	47,400	+600
Michigan	47,000	47,400	—400
Montana	20,400	21,500	—1,100
Indiana	17,200	17,300	—100
New York	14,700	15,000	—300
Kentucky	12,500	12,400	+100
West Virginia	10,000	12,000	—2,000
Ohio	9,000	9,000	.....
Colorado	6,500	5,900	+600
Nebraska	5,200	5,600	—400
Total	4,101,800	4,138,400	—36,600

DENVER, Colo., Jan. 26.—There were several gatherings of oil men in Denver from over the Rocky Mountain area the past week. The only one which furnished outward evidence of what took place was held in the office of M. J. Foley, director of production for District 4 under OPC. This had to do primarily with Coordinator Ickes' order establishing quotas for Colorado, Wyoming and Montana for January.

The only part of the proceedings made public was that Colorado protested the allowable of 5,900 bbl. daily and Wyoming the quota of 78,600 bbl., these being below the actual output for which there is a market. The Colorado commission presented figures showing the producers in that state were actually producing 7,459 bbl. daily, but that even this was far below the state's consumption. Wyoming is producing 85,200 bbl.

MISSISSIPPI

GOVERNMENT INTERVENTION in the state's conservation program will result unless Mississippi "puts its affairs in order," E. De Golyer of Dallas, Tex., director of conservation for OPC, told a joint meeting of the state senate and house. The legislature is considering revision of oil and gas statutes.

ARKANSAS

FORTY-ACRE SPACING was ordered by the Oil and Gas Commission for the newly discovered Midway field near Lewisville. The commission also set a sliding scale for the daily allowable production ranging from 400 bbl. down to 200 bbl. a day as new wells are completed. The field was recently opened by Barnsdall Oil Co., Tulsa. Representatives of the company testified that the well could produce 18,000 bbl. daily on open tubing. It is now on a daily allowable of 400 bbl.

Operators Seek Changes in East Texas Brine Order

AUSTIN, Tex.—East Texas operators at a Railroad Commission hearing here last week suggested changes in the field's existing salt-water-disposal regulations. The proposals made by representatives of East Texas companies would change the existing order to the extent that: (1) Wells producing over 100 bbl. of water daily could be closed in and their allowable taken from other wells on the same lease; (2) that bonus oil granted an operator for the injection of brine could be produced from wells on other leases of the operator, or he could assign all or any part of the oil bonus to any other operator or to a salt-water-injection company. That the operators are wholly in accord as to the necessity for the changes was evidenced by the fact that no dissension was voiced.

Based on the commission's December report, it was brought out that the field now has 5,368 wells producing 438,773 bbl. of water daily. Of this volume 217,141 bbl. is produced by 4,441 non-marginal wells and the remaining 221,632 bbl. by 927 marginal wells. To show the need for closing in the big water wells it was brought out that 1,292 wells were producing some 358,056 bbl. of the field's total daily water output, all producing over 100 bbl. daily. A classification of these 1,292 wells on a percentage-water basis and on a volume basis is given in Tables 1 and 2.

These tables, of course, represent the amount of water that would not be produced if all of these wells were closed in and their allowables produced by other wells. Frank Speller, consulting engineer of Tyler, Tex., brought out that in actual practice, however, only about 161,000 bbl. of water could be eliminated by such action. While this represents only 45 per cent of the 358,056 bbl., elimination of the need for returning this volume would in itself materially cut down the operator's disposal problem.

The suggested provision for shutting down of wells producing over 100 bbl. of water daily included the clause that such action was for only a 6-month period. At the end of this time a test of at least 72 hours' duration would have to be made of such a well to determine the capacity of the well to produce oil, its proper oil allowable and its water production. If the tests show the well still to be making over 100 bbl. of water the operator would again have the option of closing it for 6 months and producing its allowable from other wells on the lease.

Provisions of Commission's Order

The commission's present order provides for the granting of an added 1-bbl. oil allowable for each 50 bbl. of salt water returned, with a maximum of 8 bbl. (or 400 bbl. of water); that this bonus oil can be distributed among other wells on the lease, but not more than 6 bbl. to any one well. The order proposed, however, would amend this to the effect that no well producing more than 25 per cent water should be given the right to produce additional oil by transfer of allowable arising from the returning of water to the reservoir. The purpose of this proposal, of course, is to prevent any well from producing more water by reason of its being granted all or a portion of the bonus oil resulting from the injection of a lease's brine output.

At the hearing considerable time was devoted to the various angles of the field's disposal and pressure-maintenance problems. Some operators contended that the bonus oil given for the return of salt water should be granted to the disposal corporation rather than to the operator who produced the water.

Railroad Commission Chairman E. O. Thompson praised the formation of the company as one of the most constructive moves ever made for the conservation of natural resources. Colonel Thompson said he saw no objection to the proposed changes and that the commission welcomed the suggestions.

TABLE 1—CLASSIFICATION ON A PERCENTAGE-WATER BASIS OF WELLS PRODUCING 100 BBL. OR MORE OF SALT WATER DAILY

Per cent water:	No. of wells	Barrels daily—Oil	Barrels daily—Water
80-84	49	975	5,528
85-89	229	4,468	30,244
90-91	196	3,488	33,920
92-93	153	2,768	34,365
94-95	202	3,394	59,846
96-97	272	3,677	103,889
98-99	187	1,549	87,800
99 and over	4	13	2,464
Total	1,292	20,332	358,056
Average	....	15.74	277.13

TABLE 2—CLASSIFICATION ON A VOLUME BASIS OF WELLS PRODUCING 100 BBL. OR MORE OF SALT WATER DAILY

Bbl. water daily:	No. of wells	Barrels daily—Oil	Barrels daily—Water
100-124	165	3,018	18,460
125-149	128	2,065	17,683
150-174	89	1,404	14,293
175-199	139	2,385	25,490
200-224	85	1,391	17,541
225-249	99	1,564	23,163
250-274	80	1,247	21,085
275-299	40	468	11,413
300-324	70	1,118	21,895
325-349	43	580	14,468
350-374	31	394	10,973
375-399	76	1,266	29,112
400-424	28	354	10,628
425-449	32	419	13,524
450-474	27	349	12,497
475-499	40	657	19,258
500-999	120	1,626	73,520
1,000 and over	2	27	3,053
Total	1,292	20,332	358,056
Average	....	15.74	277.13

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Pattern of 1942

The information contained in this Annual Outlook and Review Number presents the pattern of 1942 operations for the petroleum industry.

A review of what was accomplished in 1941 and previous years is necessary in charting the course of what will be one of the most momentous years in petroleum history. The complete and coordinated statistical reports in this issue not only summarize the past but, more importantly, they reveal what must be done in the future if petroleum operators are to do their part in carrying on a war abroad and in maintaining an equally essential economy at home.

It is important to know that the petroleum demands in this country last year aggregated some 1,586 million barrels, which is four times the demands during the first year of the previous World War. It is significant in many ways that last year's gain in domestic gasoline consumption was much greater than that of any previous year.

It has been a year of outstanding accomplishments with the numerous problems taken in stride. Many would have said that domestic producers and refiners could not expand their operations in 1 year to take care of a 500,000-bbl. daily increase in demand. But they have done just that without a penny of subsidy or special consideration from a Government which has found many cripples in directing this country's industrial operations.

To do what had to be done it was necessary to drill 32,140 wells. The footage of these wells totals nearly 20,000 miles, or four-fifths of the distance around the globe at the equator.

Construction of trunk pipe lines for the year—a major contribution to war preparedness—if placed end to end would span the country more than twice from New York to San Francisco. In regard to marketing, those directing the expansion of the defense industries did so with the knowledge that petroleum would be supplied wherever it was needed, and in whatever quantities required.

Closely allied to these activities was the expansion of the natural-gas industry. New reserves were found and transportation was extended and enlarged so that natural gas will play an increasingly important part in furnishing fuel for war enterprises.

The incentive of higher price had little to do with these activities. Price trends in this industry from 1937 through 1940 were generally downward, reaching unprofitable levels in many markets. Government reports showed that in 1940 the wholesale petroleum price index was less than two-thirds the average of all commodities. Advances since that time have been less than the average of other industries.

It is inaccurate to state that all this belongs to the past. Petroleum is a continuing industry. The new field discovered last year furnishes part of this year's petroleum and that of 1950. Similarly, the well that was not drilled last year because of dissatisfaction regarding price, must be subtracted from this year's oil supply. The refiner who could not build the needed additional cracking capacity because materials were not available, probably will get by in some manner for a year or two but if not corrected, manufacturing operations, looking forward to the needs of coming years, have been handicapped to that extent.

The petroleum industry was prepared for the defense needs of 1940 and 1941 and the war requirements of the past few weeks because it has always been its policy to maintain operating capacity ahead of the needs of its customers. Despite the enlarged demands of the past year, it still has excess capacity in some phases of its operations. But what it can do later this year and the more critical period to come will be determined by how it is permitted to operate now. Petroleumwise, the shadow of today's mistakes will steadily lengthen.

By W. V. HOWARD

Proven oil reserves of the United States as of January 1, 1942, totaled 20,299,542,000 bbl. This is an increase of 200,285,000 bbl. during the year after deducting 1941 production of 1,391,544,457 bbl.

Increased production during 1941, coupled with the small addition to reserves, has lowered the years' supply of crude 0.4 years to 14.6 years at last year's rate. Based on the record of the last quarter of 1941, the years' supply of crude in reserve is lowered 1 year to 13.6 years.

There were 341 new pools or new pays discovered during the year, or nearly one per day, with an average proven reserve of 1,427,962 bbl.

ESTIMATED proven reserves of oil in the United States are 20,299,542,000 bbl., an increase of 200,285,000 bbl. over January 1, 1941. With production at a higher rate in 1941 than in 1940, this represents 14.6 years' supply compared with 15.0 years' supply last year. If production is maintained at the rate prevailing during the last 3 months of 1941, the reserve is reduced to 13.6 years' supply.

From the standpoint of new reserves discovered, 1941 was a more successful year than 1940. The number of discoveries, either of new fields or of new pays in old fields, was 341, representing 486,935,000 bbl. of proven reserves. This is a minimum estimate as many of the new fields were one- or two-well pools at the end of the year. The expected increase may be larger than normal as a large proportion of the discoveries were made late in the year. The proven reserves in new pools in 1941 was 135,846,000 bbl. greater than in 1940 and the average reserve per discovery was 1,427,962 bbl.

Extensions Add Billion Barrels

Extensions to old fields added 1,009,175,000 bbl. to the nation's reserves or 41,801,000 bbl. more than last year's extensions. The total quantity of new oil found in 1941 was 1,496,110,000 bbl., compared with 1,217,463 bbl. in 1940. The largest single reserve added through extensions was at Hawkins, in East Texas, which was discovered late in 1940 and proved to be the only first-class field of the year.

Revisions of former estimates represent only a minor quantity in the current estimates, being an increase of 95,719,000 bbl., compared with last year's revision of 432,693,000 bbl.

For convenience, the nation has been divided into 33 districts representing either a state or a major division within a state. Of these 17 had an actual reduction in reserves during 1941. Changes in rates of production give 18 districts a smaller reserve in terms of years' supply of oil.

Of the major producing states, Texas leads in the quantity of new oil found with 669,290,000 bbl. This amount, together with upward revisions of old estimates slightly improves that state's position with respect to years' supply and gives it a total of 56.6 per cent of the nation's reserves, an increase of 0.7 per cent above last year. Four districts in Texas show a decline in reserves namely West Central and South Central Texas, the Panhandle and the Upper Gulf Coast. In both West Central Texas and the Gulf Coast there were important discoveries but downward revision of old areas reduced the former area's proven reserve and the same effect was achieved by an increase in production from the Gulf Coast.

Important increases in reserves are in prospect in three Texas districts. On the Gulf Coast, the Wilcox trend play has yielded a number of discoveries which are still in the one- or two-well stage and whose full extent cannot be estimated at this time. It is expected that some of these pools will develop into major fields. In North Texas, the Ellenburger has been proved productive over a wide area in Wichita, Archer and Wilbarger counties. At present each producing sector is considered as a separate pool but there is good evidence that further development will join many of these areas making fields whose extent is as large or larger than that covered by the Pennsylvanian pays. Engineers estimate that the unit water-flood now set up in the East Texas field will add from 500,000,000 to 800,000,000 bbl. to the recoverable reserve in that field. In West Texas, the prospects of large increases are not so definite but the relatively large number of discoveries in the northern sector and also in the Ordovician in the southern sector make it possible that 1942 will see another large increase in the reserves of this area. It need not be pointed out that these reserves cannot be added, except in the case of East Texas, if there is not sufficient drilling to prove them.

California Shows Decline

From the standpoint of reserves, California stands second with 16.7 per cent of the nation's total. This is a drop of 0.7 per cent from last year's figure, the decline being due to the fact that not only did California find only about one-half of its production but also because reserves in some of the San Joaquin Valley fields suffered sharp

downward revision which was not balanced by upward revisions elsewhere.

Oklahoma, in third place with 4.8 per cent of the nation's reserves continued its decline although the Apache discovery reduced it to 75 per cent of last year's drop and pointed the way to possible new discoveries in the Anadarko basin. Louisiana added nearly 100,000,000 bbl. to its reserve and is crowding Oklahoma for third place.

Important changes took place in some of the other states, particularly in Kansas, Illinois, Arkansas and Michigan. In Kansas there was much drilling up of areas between producing fields with consequent linking of the areas. This process should continue for several years and may even be accelerated if 40-acre drilling units are set up. Three new developments took place in 1941 which promise much activity in the near future. These are the extension of the Viola-Misener trend play east from Stafford County, the finding of production in Pennsylvanian sands in Kearny County and the discovery of several pays in Barber County on the flank of the Anadarko basin.

Many Pools Found in Illinois

Illinois added greatly to its reserves by the discovery and extension of prolific Chester and McClosky pools, mainly in Hamilton and Wayne counties, and the Benton pool in Franklin County. Some of this new oil was offset by a realization that estimates on some of the older fields were more optimistic than their later history warranted. One development was officially recognized by the linking of several groups of fields into Clay City, Dundas, Keensburg and New Harmony. This process will continue during the coming year as several other major areas are practically merged at the present time. It is interesting to note that 1941 was a more active year than 1940 so far as prospecting is concerned and that 40 per cent of all the fields opened in the basin since the play started in 1937 were found last year.

Michigan started off with one of the poorest half years in the state's oil history and ended with one of the best. The new fields found in 1941 lie mostly to the north of the older productive belt and have opened up a large new area for prospecting. Reed City is generally recognized as the most important find in recent years with Winterfield and Headquarters (Roscommon County) not far behind. In addition to the oil, large gas reserves have been developed in this area.

Arkansas' Prospects Good

Arkansas saw considerable development of the Smackover lime but the most important discovery has not been considered in this estimate because the well was not completed until after the beginning of 1942. This is the Midway discovery in northern Lafayette County. Hailed as the most important discovery since Magnolia, this find has not only added more probable reserves than all of 1941's activity but it has also opened up a whole zone which was formerly considered nonproductive.

Two facts which have been partially learned in other years may be emphasized in the light of 1941 developments. Of these, one is that a dry hole or two and a possibly erroneous geological concept should not condemn an area. This was shown in Arkansas and also in other areas. The other is probably even more important in view of the present emergency demand for developed reserves. That is that a poor discovery well may open a very large reserve. The list of small discoveries, neglected for years, which opened fields of major importance is long. It includes the K.M.A. lime at K.M.A. and Slaughter. Had two other wildcats not been under way at the time of discovery, it might have included East Texas. This year Michigan operators found that small wells at Reed City, Winterfield and Adams did not necessarily mean small fields. Woodlawn in Illinois started a full-sized boom over a year after it was discovered. Any restriction of drilling around a small discovery well may thus delay the opening up of a large pool. Any restriction of drilling activity may, in fact, materially imperil the reserve situation. Regardless of the wildcatter, the bulk of the nation's new oil will continue to come from fields under development and if prior years are a criterion, continued development of 1941's discoveries should add between 1,000,000,000 and 1,250,000,000 bbl. to the nation's reserves during the next few years.

Discovery Data

Maps and tables showing new fields and extensions found in 1941 are on Pages 78 to 80.

Proven Oil Reserves on January 1, 1942

State and district—	Estimated reserves as of Jan. 1, 1941	Revision of previous estimate	1941 Discoveries	1941 Extensions	Total	Less 1941 production	Estimated reserves as of Jan. 1, 1942	Gain or loss (—)	Years' supply: As of Jan. 1, 1941	Years' supply: As of Jan. 1, 1942	Per cent Jan. 1, 1942
California	3,502,357,000	—13,700,000	12,130,000	115,750,000	3,616,537,000	230,342,000	*3,386,195,000*	—116,162,000	15.6	15.2	16.7
Southern	998,499,000	91,300,000	500,000	50,000,000	1,140,299,000	104,274,000	*1,036,025,000*	37,526,000	9.2	9.9	5.1
Coastal	467,251,000	5,000,000	2,500,000	10,000,000	484,751,000	32,243,000	*452,508,000*	—14,743,000	16.3	14.0	2.2
Northern	2,036,607,000	—110,000,000	9,130,000	55,750,000	1,991,487,000	93,825,000	*1,897,662,000*	—138,945,000	23.3	20.2	9.3
Montana	81,617,000	.....	360,000	1,280,000	83,257,000	7,343,000	*75,914,000*	—5,703,000	12.4	10.3	0.4
Wyoming	268,649,000	.....	.....	9,920,000	278,569,000	30,121,000	*248,448,000*	—20,201,000	10.2	8.2	1.2
Colorado	22,764,000	.....	4,500,000	4,500,000	31,764,000	1,733,000	*30,031,000*	7,267,000	16.2	17.3	0.1
Utah	16,000	.....	.....	.....	16,000	2,000	*14,000*	—2,000	8.0	7.0	0.0
New Mexico	700,098,000	.....	120,000	.....	700,218,000	38,660,000	*661,558,000*	—38,540,000	18.1	17.1	3.3
Texas	11,238,439,000	67,261,000	87,545,000	581,645,000	11,974,890,000	496,100,000	*11,478,790,000*	240,351,000	23.0	23.1	56.6
Panhandle	697,512,000	.....	.....	.....	697,512,000	27,757,000	*669,755,000*	—27,757,000	26.7	24.1	3.3
West	2,679,338,000	.....	18,330,000	216,190,000	2,913,858,000	87,881,000	*2,825,977,000*	146,639,000	32.2	32.2	13.9
North	720,736,000	.....	13,750,000	45,480,000	779,966,000	39,358,000	*740,608,000*	19,872,000	18.6	18.8	3.6
West Central	144,432,000	—4,404,000	9,590,000	1,975,000	151,593,000	9,615,000	*141,978,000*	—2,456,000	13.8	14.8	0.7
East	3,146,544,000	.....	6,670,000	224,200,000	3,377,414,000	159,062,000	*3,218,352,000*	71,808,000	18.8	20.2	15.9
South	289,723,000	15,702,000	3,250,000	8,450,000	317,125,000	26,345,000	*290,780,008*	1,057,000	10.6	11.0	1.4
South Central	61,974,000	5,805,000	130,000	.....	67,909,000	6,790,000	*61,119,000*	—855,000	8.0	9.0	0.3
Lower Gulf	816,528,000	33,479,000	1,590,000	60,800,000	912,397,000	41,930,000	*870,467,000*	53,939,000	18.6	20.8	4.3
Upper Gulf	2,681,652,000	16,769,000	34,235,000	24,550,000	2,757,206,000	97,362,000	*2,659,844,000*	—21,808,000	32.3	27.3	13.1
Louisiana	925,975,000	49,990,000	66,630,000	97,300,000	1,139,895,000	115,810,000	*1,024,085,000*	98,110,000	8.9	8.8	4.8
Gulf Coast	743,735,000	54,190,000	50,290,000	62,300,000	910,515,000	88,919,000	*821,596,000*	77,861,000	9.4	9.2	3.8
North	182,240,000	—4,200,000	16,340,000	35,000,000	229,380,000	26,891,000	*202,489,000*	20,249,000	7.4	7.5	1.0
Arkansas	329,651,000	27,242,000	13,800,000	17,280,000	387,973,000	32,336,000	*355,637,000*	25,986,000	12.7	11.0	1.8
Mississippi	44,415,000	.....	1,060,000	47,000,000	92,475,000	15,658,000	*76,817,000*	32,402,000	10.4	4.9	0.4
Oklahoma	1,183,629,000	.....	68,550,000	5,100,000	1,257,279,000	153,257,000	*1,104,022,000*	—79,607,000	7.9	7.2	5.4
Kansas	747,841,000	—13,130,000	15,300,000	85,080,000	835,091,000	82,421,000	*752,670,000*	4,829,000	1.3	9.1	3.7
Nebraska	2,861,000	1,000,000	500,000	.....	4,361,000	1,929,000	*2,432,000*	—429,000	9.9	1.8	0.0
Illinois	548,678,000	—34,944,000	178,690,000	44,320,000	736,744,000	128,631,000	*608,113,000*	59,435,000	3.7	4.7	3.0
Indiana	30,952,000	.....	3,150,000	.....	34,102,000	7,326,000	*26,776,000*	—4,176,000	8.2	3.7	0.1
Kentucky	50,884,000	.....	.....	.....	50,884,000	4,884,000	*46,000,000*	—4,884,000	9.5	9.4	0.2
Tennessee	404,000	.....	.....	.....	404,000	46,000	*358,000*	—46,000	8.8	7.8	0.0
Michigan	64,816,000	.....	31,600,000	.....	96,416,000	16,324,000	*80,092,000*	15,276,000	3.3	4.9	0.4
Ohio	37,219,000	.....	3,000,000	.....	40,219,000	3,367,000	*36,852,000*	—367,000	11.9	10.9	0.2
West Virginia	38,035,000	.....	.....	.....	38,035,000	3,415,000	*34,620,000*	—3,415,000	11.1	10.1	0.2
Pennsylvania	231,773,000	.....	.....	.....	231,773,000	16,659,000	*215,114,000*	—16,659,000	12.5	12.9	1.1
New York	48,185,000	12,000,000	.....	.....	60,185,000	5,180,000	*55,005,000*	6,820,000	14.0	10.6	0.3
Total United States	20,099,258,000	95,719,000	486,935,000	1,009,175,000	21,691,087,000	1,391,544,000	*20,299,543,000*	200,285,000	15.0	14.6	

In this exclusive statement to The Oil and Gas Journal, Mr. Ickes reviews the problems that confront the industry in its conversion to wartime economy. He points out how the OPC is safeguarding the oil business from the unfavorable effects of governmental regulations, even though, he contends, the latter are necessary to a certain extent. He praises the industry for its foresight, its cooperative spirit, its patriotism and its determination to do the job.

HAROLD L. ICKES

OPC Proud of Way Industry Has Risen to Emergency

By HAROLD L. ICKES
Petroleum Coordinator for National Defense

THE oil industry enters 1942 in the midst of a complex of circumstances which can hardly fail to produce a mixture of reactions.

First, it has probably not faced, since the price panic of 1933, a set of conditions so worrisome as those that prevail today.

Second, it has never had, in all its history, the opportunity to serve its country as greatly as it can—and must—in this crisis.

Concerning the first point, I hope that everyone in the industry understands that the Office of Petroleum Coordinator is sharply and constantly aware of the difficulties which prevail. We realize that every phase of activity, from the exploration field to the filling-station driveway, has felt the results of material and equipment shortages. We are constantly cognizant of the damage which the oil business will suffer because our rubber supplies have been blocked. We know how the industry's transportation has been disrupted, how its tax burden has grown, how its technical staffs have been depleted by the requirements of the armed forces and other government agencies. These, and the many other troubles of the industry, are not only well known to us. They are the object of our incessant concern.

I believe that the majority of the industry will agree that we have provided some real help in the overcoming of these troubles. We have expedited applications for project ratings and priorities. We have worked with oil men to explore the possibilities of large-scale synthetic-rubber production. We have cooperated with them in working out solutions to transportation difficulties—even though our cooperative efforts have not always been successful, as in the case of the proposed Texas-New York pipe line, which would now be nearly completed if it had been approved. I believe we all agree that it would be quite comforting, now, if we could know that, by summer, we would have a nonsinkable pipe line, capable of delivering 250,000 to 350,000 bbl. of oil to the East Coast every day.

We have supported the pleas of the industry for certificates of necessity; we have backed their requests for lower rail rates; we have appealed to the selective service authorities in behalf of their technical men.

We have done these things because we believe that they are in the public interest, and that there should be the least possible dislocation of the industry. This is essential if we are to take the long-range view. We must do our best to plan our actions during this emergency so that the industry may return to its normal pattern of operations with the minimum of readjustment difficulties after the war.

But, there is another reason—and the most important of all—why we have done these things. From the time that this office was created, last May 28, until the sneaky attack on Pearl Harbor, we were engaged in building our defense. Since then we have been at war. Both of these conditions have required cooperation—the very ultimate in cooperation. That, at least, is our belief here in America. Hitler and his errand boys, Mussolini and Tojo, believe that nations can perform at peak efficiency only under a dictatorship. We are undertaking to demonstrate that they are in error.

Voluntary Cooperation Sought

It was because of this conviction that voluntary cooperation is the best process in getting a job done, that I appointed our district industry committees last summer, and, later, was able to enlist the services of 66 outstanding oil men for the Petroleum Industry Council, a group which supplements and does not supersede, the district committees. The council deals with problems which are national in scope; the district committee with regional questions.

I confess that I am just a little proud in the knowledge that no other industry has such a mechanism for active and continuing cooperation with a government agency. I confess that I am very considerably pleased with the evidence that this cooperative effort has been successful. All of us have not always agreed on every action or policy, but I am glad to say that neither side has been backward in advancing its arguments, and that our debates have usually been in good spirit. I believe that such give-and-take is a wholesome thing. I believe that criticism is a wholesome thing. We need give-and-take and criticism to show us if we are wrong; to help us determine the best course of action. Heaven forbid that I may ever have any "yes" committees. In a speech at San Francisco last November, I invited the oil industry to be vocal—to express itself freely at all times concerning any policies or actions of the Office of Petroleum Coordinator. I repeat that invitation now. I repeat now, also, my often-enunciated assertion: I have neither the desire nor the intention to attempt to be the oil country's "czar," or dictator, or boss, or whatever term one may choose to apply.

With a negligible few exceptions, oil men agree that some form of government direction must be given to the industry's efforts at this time as a means of assuring maximum utilization of all facilities for the war effort. This is true because it is necessary to call upon many companies and individuals to do things which cause them corporate or personal inconvenience—yes, even financial loss. It is necessary, for example, to ask that certain raw materials, products, patents, processes and facilities be pooled or shared; that certain equipment and raw materials be used for military production instead of for normal commercial purposes; that certain production practices be altered for the general good, which means winning the war. These requirements, and others with which all oil men are familiar, mean that everybody can't drill as much as he formerly did, or build as many filling stations, or make all of his products on a peacetime ratio, or extend pipe lines without restriction. But my opinion is that thinking men are aware that we do not ask these things in any spirit of repression or in any desire to "run" the industry. We ask them simply and only because there just isn't anything more important than winning the war as quickly as possible, and because anything which will contribute to that end just has to be done—and will be done.

The industry, with one or two unimportant exceptions, has shown a full understanding of the situation and a willingness to cooperate frankly and fully. Its record of cooperation so far is one which cannot be matched, even closely, by any other industry. I have, therefore, full confidence in the industry's ability to accomplish the tremendous undertaking which it has been given by its commander-in-chief, the president. The assignment to provide the fuel and lubricants that will insure the full operation of 185,000 planes, 70,000 tanks and 18,000,000 deadweight tons of ships and to deliver those products when and where needed. To an industry less sturdy and resourceful, such an assignment would be staggering. To the oil industry, it is, to be sure, a challenge that is going to mean wrinkled brows and midnight oil—but a challenge that has already been willingly accepted.

Our schedule for 100-octane gasoline must obviously be revised upward. Our needs for 91-octane for tanks, and 80-octane for trucks and other mechanized equipment will continue to mount. Our requirements for specialized lubricants will soar and all of this is on top of the great demand for the other petroleum products needed by the armed forces, industry and the public generally.

In addition to all of this, the industry has now been given a new and monumental task—the task of producing most of the butadiene and styrene from which we must make huge quantities of synthetic rubber—perhaps as much as 600,000 tons a year before we are through, although we hope that we will not require so much. I believe I can safely say that no industry has ever had a heavier load placed upon it, but I believe I can also safely say that no industry is more competent—or patriotically ready—to carry it.

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OPC's Washington and District Offices Are Steadily Expanding

ADDITIONAL duties thrust upon the district office of the Office of Petroleum Coordinator by Conservation Order M-68 and Preference Rating Order P-98 resulted this week in recommendations that personnel should be expanded to assure expeditious handling of those functions.

The Washington, D. C., staff of the OPC consists of about 75 key men but most of the district organizations are still in process of formation. The names and titles of top men both in the OPC Washington office and the district branches are listed in the accompanying directory.

OFFICE OF PETROLEUM COORDINATOR FOR NATIONAL DEFENSE

Interior Department (New Building) 18th and C Sts., N.W. Phone Republic 1820

Coordinator.—Harold L. Ickes, room 6156, extension 500.

Deputy Coodinator.—Ralph K. Davies, room 6654, extension 3831-2.

Deputy Coordinator's Staff. — (Sixth and seventh floors, New Interior Building). Charles J. Deegan, room 6420, extension 4735; H. Chandler Ide, room 6654, extension 3833; James Moore, room 6648, extension 4796; J. Elmer Thomas, room 6420, extension 4735.

Special Assistants.—George W. Holland (conservation), room 7020, extension 643; Gordon M. Sessions (public relations), room 7519, extension 2621.

Production Division. — Robert E. Allen, director, room 6647, extension 3334; Paul M. Raigorodsky, assistant director and chief of natural-gas section, room 7423, extension 4774; Ralph J. Schlithuis, assistant director, room 6642, extension 2907; Nicholas G. Dumbros, room 6070-A, extension 4507; Malvin G. Hoffman, room 6070-A, extension 4507; Thomas R. Weymouth, room 6070, extension 4774; Parke A. Dickey, room 6070-A, extension 4509.

Refining Division.—Wright W. Gary, director, room 6637, extension 3233; Robert B. Cragin, assistant director, room 6646, extension 3237-4644; Phillip M. Robinson, assistant director, room 7416, extension 4786-87; George Gibson, room 7420, extension 3040; Ernest J. Green, room 6637, extension 3233; Herbert J. Hofmann, room 7426, extension 4781; Merrill J. Kiser, room 7422; extension 4618; George A. Norris, room 7426, extension 4781; Farrand D. Parker, room 7422, extension 4780; Earl Petty, room 7418, extension 3431; William C. Stewart, Jr., room 7426, extension 4781; Joseph E. Westenberg, room 7424, extension 4798; Dustin W. Wilson, room 6646, extension 2105; D. P. Bailey, room 7418, extension 3431; Bruce K. Brown, room 6646, extension 2066; Joseph A. Costello, room 7413, extension 3968; William V. Keeley, room 7419, extension 2649; Dallas R. Lamont, room 7419, extension 2649; George L. Parkhurst, room 6646, extension 2066.

Transportation Division.—H. A. Gilbert, director, room 6629, extension 4418; Allan H. Hand, assistant director, room 6627, extension 3557; Fred I. Richards, room 6618, extension 4754; C. L. Lockett, room 6620, extension 4627; Boyd Wilson, room 6622, extension 4620; W. C. Eberle, room 6622, extension 4620; H. T. Mather, room 6624, extension 4626.

Marketing Division.—John W. Frey, director, room 6623, extension 4646; Paul A. Best, assistant director, room 6625, extension 3518; Charles R. Denis, room 6628, extension 4434; Ned F. Foulds, room 6425, extension 4797; William M. Little, room 6427, extension 4797; John E. Mayo, room 7415, extension 4635; Lawrence V. Shaughnessy, room 6427, extension 3498; Joe Ellender, room 7415, extension 4635.

Research Division.—Edward B. Swanson, director, room 7313, extension 749; Oliver S. Ambrose, assistant director, room 7317, extension 4777; Richard M. Murphy, room 7319-21, extension 4778; Ernest A. Wye, Jr., room 7319, extension 4785; Richard G. McCabe, room 7319, extension 4785; Robert W. Olinger, room 7319, extension 4785.

Conservation Division.—Everett Lee De Golyer, director, room 7516, extension 4459; James H. Hall, room 7516, extension 4459.

Materials Division.—William F. Huff, director, room 7514, extension 4585; Sturgis L. Stentz, assistant director, room 7514, extension 4622-23; Robert B. Shirk, room 7514, extension 2140; H. W. Breyfogle, room 7514, extension 3683.

Legal Division. — J. Howard Marshall, chief counsel, room 6649, extension 4100; David M. Hudson, associate chief counsel, room 6422, extension 793; Elmer E. Batzell, room 6424, extension 2181; Robert E. Friedman, room 6426, extension 668; Adolph H. Levy, room 7517, extension 4650; Justin R. Wolf, room 6424, extension 2181.

OPM Priority Consultant.—James E. Hughes, room 7416, extension 4616; Robert K. Lyle, room 7514-16, extension 4616-17.

Executive Officer.—Stanley W. Crosthwait. room 6515, extension 4363.

Liaison.—Gen. Walter B. Pyron, liaison agent between Army Department and OPC. Phone Republic 7600, extension 6044, room 6261, New War Department Building.

Information Division.—Herbert A. Yocum, director, room 6620, extension 3844; Ludwig Caminita, room 6620, extension 3844.

Foreign Division.—W. D. Crampton, associate director, room 7452, extension 4788; C. S. Snodgrass, associate director, room 7450, extension 4789; James T. Duce, associate director, room 7444, extension 4417; George T. Ballou, room 7450, extension 4891; John D. Kurtz, room 7452, extension 4891.

Tanker Control Board.—Mr. Davies, M. W. Bowen, room 7512, extension 4744; Comdr. W. M. Callahan, room 7512, extension 4744; Maj. J. R. Parten, room 7512, extension 4744; Eugene Holman, room 7512, extension 4744, and L. E. Fleming; F. Willard Bergen, executive secretary, room 7512, extension 4744; T. Harry Norris, assistant, room 7512, extension 4744; Joseph Winterberger, room 7512, extension 4744, technician.

Receptionist.—Mrs. Rosalie E. Reid, room 6635, extension, 3429.

Petroleum Specialist.—Ruth Sheldon Knowles, room 5043, extension 570.

DISTRICT OPC OFFICERS

DISTRICT 1

122 East Forty-second St., Chanin Bldg., New York City

Production Section.—James R. Wylie, Jr., district director, Henry W. Fuellhart, chief development and production analyst; Richard D. Hughes, principal petroleum division analyst.

Natural-Gas and Natural-Gasoline Section. — Frank M. Brewster, chief; Virgil F. Bowyer, assistant chief.

Refinery Section.—Distin W. Wilson, district director.

Marketing Section.—Louis H. Spinner, district director and acting director in charge; Charles A. Lockard, senior marketing analyst.

Legal Section.—Charles L. Harding, district counsel.

Office Manager.—Walter J. Heisen.

DISTRICT 2

120 South La Salle St. Bldg., Chicago, Ill.

Production Section.—Wirt Franklin, district director and director in charge.

Refinery Section.—Douglas P. Bailey, district director.

Transportation Section.—Walter Dumont, district director.

Materials Section.—Edward E. Robbins, district director.

Legal Section.—Charles K. Schwartz, district counsel.

DISTRICT 3

245 Mellie Esperson Bldg., Houston, Tex.

Production Section.—Grady H. Vaughn, district director for production; E. O. Buck, assistant director of production; Glenn P. Thompson, production analyst.

Natural-Gas and Natural-Gasoline Section. — D. E. Buchanan, chief of section.

Refinery Section.—G. T. Granger, district director.

Legal Section.—J. P. Rice, district counsel.

Conservation Division.—W. J. Murray, Jr., conservation engineer. J. H. Murrell, conservation engineer.

Office Manager.—William F. Bryant.

DISTRICT 4

817 Seventeenth St., United States Natl. Bank Bldg., Denver, Colo.

Production Section.—Michael J. Foley, district director; Albert W. Weeks, chief petroleum analyst; Joseph J. Zorichak, assistant petroleum production analyst.

Refinery Section.—Earl Petty, district director.

Office Manager.—Albert R. Novak.

DISTRICT 5

417 S. Hill St., 855 Subway Terminal Bldg., Los Angeles, Calif.

Production Section.—Lt. Comdr. Wentworth H. Osgood, district director and director in charge; Edmund Jussen, assistant district director; Eugene L. Davis, chief of production section; Eugene D. Hardison, petroleum production analyst; William Kleinman, petroleum production analyst; Charles L. Moore, associate petroleum analyst; Harry Scarborough, assistant production analyst; Phoebe Tice, assistant production analyst; Lucy T. Perkins, assistant petroleum development analyst; Edward E. Easton, production specialist.

Nautral-Gas and Natural-Gasoline Section. — Reed W. Garman, assistant chief.

Conservation Section.—Everett Trostel, district conservation engineer.

Refinery Section.—Harold Sydnor, district director; Vernon W. Balzer, refinery materials specialist.

Materials Section.—Charles T. Reichert, district director.

Transportation Section.—Dale Gibson, acting district director.

Marketing Section.—Charles B. Garretson, district director and assistant director in charge; H. E. Britzman, senior petroleum specialist.

Legal Section.—Clyde Thomas, district counsel.

Office Manager.—Harry L. Gardner.

VIEWS

The Journal's editors asked a representative group of operators to give their views regarding the 1942 outlook and how the petroleum industry can best serve the nation and its Allies during the war emergency. Several of these expressions are here presented. The remaining contributions to this forum will appear in later issues of the Journal.

Thaw Out Frozen Checkerboard Leases in Favorable Spots

By JAMES H. GARDNER
President, Gardner Petroleum Co.

ONE effective way to increase the proved oil reserves in the United States is for the operators to adopt a more generous attitude to thaw out the frozen checkerboarded leases in favorable spots. In order to make the situation clear let us assume one of many cases that show the evils of the checkerboarded system where the big fellows and the little fellows are all "dogs in the manger."

Operator A is seeking a place to drill a well and from his interpretation of the surface geology and its relation to his interpretation of the subsurface, he would like to apply one or more of the various techniques and the expense in connection therewith, in investigating Sections 1, 2, 10 and 12 of a certain township or lands in part of a certain survey or district. He may or may not be one of 12 or 15 different lessees who have the spot covered in a checkerboarded fashion. He needs an option agreement from all of the lessees to give him a half portion of every lease within a reasonable boundary with drilling contingent on what he learns in his investigations. But when he starts out to get such options he will likely be stopped dead in his tracks, for various illogical reasons. Company B tells him that it has a rule never to assign a lease to anybody at any place, but that it might be willing to donate some dry-hole money in case his investigation proves successful and a well is to be drilled near its property. In the assumed favorable area of 1,000 acres this party B owns two tracts of 100 acres each. That leaves 800 acres to work on whereas party A should have 500 acres optioned for a test well to justify the expense of the technical investigation and possible drilling. Then Party C, owning a 100-acre lease, says that his lease is too small to justify giving up 50 acres unless a test well is drilled as a direct offset to the 50 acres that he is to retain. The location being undecided and unknown, that about stops the works. But Party A, being ambitious, thinks he might drill for 300 acres if he can get the options and the leases should prove to be suitably located. He sees Party D, who owns three 80-acre tracts. But this party says that its "committee" would not be interested in making any such options; it never has done such a thing in the whole history of the company and the suggestion is unprecedented. The result is that if an oil field exists under this frozen checkerboard it will remain there undiscovered for the indefinite future; when the moribund leases reach the termination dates, they will all renew the leases, pay rentals and so on ad infinitum.

All lessees including large companies, small companies and individuals have a patriotic duty and a business duty to loosen up and encourage any practical plan to thaw out these frozen checkerboards whenever and wherever the opportunity arises. They are nuisances and should be so treated. Is not this the fact?

First Win War; Then Win Back Surrendered Rights

By HENRY M. DAWES
President, Pure Oil Co.

THE petroleum industry more than any other owes its success to the initiative and enterprise of individuals. Great and complicated as are many of the organizations which it has evolved, the human qualities of courage, initiative and enterprise are essential for its daily operations, as well as the meeting of occasional emergencies. If ever there was an industry of which it could be said that it was made by men and not by machines, it is our own.

This has necessarily developed a type of industry which in the present emergency can quickly and effectively meet every demand that is made upon it within the realms of reason, but it is supremely difficult for such an industry to adjust itself to a degree of regimentation under which in happier, normal days, it would have been unable to function at all. It is a rather paradoxical situation that this individualistic institution must for a time force itself into a pattern which would be destructive if adhered to afterwards. The reason is war.

Never has any industry shown a finer character and more patriotism and resourcefulness than the oil industry in its willingness to give up its freedom of action for a great cause. Such a supreme cooperation is a national necessity, and our industry does not quibble about giving it.

We will carry on, and we will win back our so freely surrendered rights and privileges when our country no longer requires us to sacrifice them.

Industry Must Make Full Use of Present Equipment

By W. S. S. RODGERS
President, Texas Co.

THERE can be little doubt that during the coming year the oil industry will have to get along with less material. We shall get priorities on certain essentials, but we simply will have to learn to be more economical in using the equipment we have.

In the field of drilling and production, the industry should adopt the practice of wider spacing of wells and more efficient recovery. Exploration and research will no doubt continue at an accelerated rate, and we shall probably secure reasonable priorities on materials needed to conduct these activities. On the other hand, I do not think we should depart from established conservation practices unless absolutely necessary for the successful conduct of the war.

We shall have to build a great many new plants to manufacture 100-octane gasoline, toluene, and the materials for making synthetic rubber. Although we shall probably get priorities on materials to build and maintain such plants, we shall have to make our equipment for the manufacture of other products last during the emergency.

Inventories of finished products should be kept at reasonable levels, but these levels will be higher than before because our armed forces must be able to get products quickly and, in many cases, without much advance notice to the suppliers.

Marketing activities, especially the building of new service stations and wholesale plants, will be practically eliminated. I hope that the industry will take advantage of this lull to put a stop to its bad practices of the past—particularly the lending of equipment of all kinds.

Industry Dedicates Itself to Victory in Nation's War

By M. L. BENEDUM
Benedum-Trees Oil Co.

THERE is but one objective to the oil industry in 1942 and that is to supply the war needs of the country and to discover and develop the new sources of petroleum necessary to maintain our reserves at their present level and thus avoid the possibility of petroleum bankruptcy in the post-war period. To that objective the oil industry has dedicated itself unstintingly.

It is a fortunate circumstance both for the industry and the country that the Government's efforts towards coordination of the industry's diverse activities has been placed in the hands of one so cooperative and broad of vision as Mr. Ickes. He has confidence in the integrity of the oil men and that confidence is wholly reciprocated. This has made for a happy situation and one which places the industry in a position to provide the necessary petroleum products whenever and wherever they are needed.

Oil will win this war. It is the one product that is absolutely indispensable to modern mechanized armies. Without it our air armadas would be grounded, our navy immobilized and our tanks and trucks worthless. We have the oil and we have the facilities for its processing and transportation. Most important of all, we have an industry that is efficiently organized to operate those facilities. The house of oil was in order long before the infamous attack at Pearl Harbor. The industry proposes to keep that house in order, not only to supply the demands of the war, but to meet the responsibilities of the economic adjustment which will be necessary when the victory has been won.

Must Plan for Service And Not for Profit

By FRANK BUTTRAM
President, Independent Petroleum Association of America

NO one can see very far into the confused future of 1942, but we can foresee that this year will be different from any year we have known. It will be a year where we will plan for service and not for profit. It will be a year in which the Government and the industry will plan for the greatest possible efficiency. It will be a year of honest thinking, hard work and selfless cooperation.

The federal Government is trying to do all in its power to aid the industry in supplying the petroleum products vitally essential for the war. We may not agree with all that is done. The fact that we are at war will not justify us in accepting programs that are wrong. Honest study and criticism free from bitterness will enable us to help in the adoption and administration of sound policies. We must recognize, however, that most of the government officials are doing their best and have shown their willingness to correct errors or to supply omissions when they discover them. The many changes in the priorities system is one demonstration of this.

Probably our great problem in this year will be the discovery of new reserves. Various branches of the Government are recognizing the need for new pools and are encouraging us to search for new pools of oil. The fact that a single governmental agency is halting this exploratory effort should not be considered as typical.

While this appears to be our outstanding problem, there are a multitude of other issues which must be considered. The Petroleum Industry Council for National Defense furnishes a national forum for their discussion. Back of and underlying all these is the one big vital question: How can we best aid America to win the war? We must not let anything interfere with that.

Rulings Severe But Based on Sound Production Practice

By HARRY H. NOWLAN
Vice president, Independent Petroleum Association of America

OUR present situation calls for facts and straight thinking in order that sound conclusions may be reached. Optimistic statements are out of order, and it is to be hoped that politics and special privileges will be banned for the duration of the war.

Rules, regulations and orders now being handed down to the industry from the Office of Production Management at Washington are severe but are undoubtedly based on sound engineering and production practice, apparently the result of long and tedious study of facts by some of the best brains in the oil business.

The primary objective at present is the largest possible production of oil with the use of the least possible amount of steel. One well to 40 acres will reduce the amount of steel used; but it will, unfortunately, reduce the volume of oil brought to the surface.

Obviously, many operators will suffer because of the difficulty, or even the impossibility, of carrying on under the new rulings. However, tomorrow these rulings may be changed—perhaps for better, perhaps even for worse—but in any case the oil business, just as the automobile business and other industries, will simply have to "take it."

We all have to hope, work, product, and FIGHT for the best until a final and complete vistory is attained.

Industry Has Accepted the Challenge of the Axis

By RALPH B. LLOYD
President, California Oil and Gas Association

THE question today is, can America as a democratic state, meet the challenge of such totalitarian states as Japan and Germany. Our answer has been given. Their challenge has been accepted. The die is cast. America is at war.

Oil is a vital necessity of modern warfare. America is relying upon the oil industry to meet the emergency demands of war on the ocean, on the land, and in the sky.

The president and the petroleum coordinator for national defense have in true democratic procedure called upon the oil industry through cooperative action to meet these demands and to aid in answering the challenge of Japan and Germany.

The oil industry has a mission of importance to fulfill. It must aid in the preservation of every well, refinery, and method of transportation to the end that, however and whenever the call for supplies is made, the industry can amply provide. It must aid in maintaining the morale of our people as well as that of our industry. We too have been challenged as to our ability to meet the slave-driven employes of the totalitarian industries. We too have accepted this challenge.

It is, therefore, necessary that we of this industry gird ourselves for the battle of survivorship. Self-discipline and self-sacrifice must become common attributes.

The spirit of America, born in the travail of war and supported by the cooperative mass movement of free men, shall again, as in the past, declare to the world that the state exists for man and not man for the state. As free men we shall prove our efficiency in war and we shall lead the way to victory and to peace.

Operators in Regulated States Will Enjoy Better Profits

By A. R. THOMPSON
Independent operator

FEDERAL controls are necessary and desirable under war conditions. Rulings made by federal authorities are based upon over-all war needs. Facts back of these rulings cannot be questioned. The application of such rulings is a matter of joint cooperation. Our problem is to fit our business practices into this over-all war picture.

The success of a blanket order such as M-68 lies in the administration of exceptions to the order, based upon sound geological and engineering experience.

At first glance a 40-acre spacing program seemed ruinous to many independent operators, especially in states like Illinois where structures are small and oil sands are very irregular in thickness and distribution. Recovery of the greatest possible amount of oil in the shortest time, however, is not a present national problem. If this problem later develops, a 40-acre spacing unit, with the original well in the center, lends itself adequately to expansion. It must be remembered that wide spacing is an emergency measure and, when the emergency is over, we can expect to drill out the given forty in a closer pattern if experience shows that it is warranted. The independent operator will find, however, that wide spacing will secure him the greatest profit from limited capital and be the most equitable from his tax standpoint.

In states where no state agency has the power to force communitization, the operator is faced with a real problem. If such states fail to enact proper legislation in cooperation with federal authorities, then it becomes the duty of the federal coordinator to take over these duties through present regional offices.

Comparison of completion costs, amount of steel, wear and tear on present equipment, adaptability of the crude to present emergency needs, transportation and refining facilities, will natural-

ly be given consideration by the Office of Petroleum Coordinator.

Industry Has Three-Point Program to Carry Out

By W. L. STEWART, JR.
Vice President, Union Oil Co. of California

AS the spearhead of the nation's all-out industrial war effort, the petroleum industry faces the greatest challenge of its history. For today we must marshal our inventive spirit, our ingenuity, and our production capacities to meet the requirements of total war. We are confronted this year with a threefold responsibility: Our first duty is to the nation's armed forces and those of our Allies. To them we must insure the constant flow of vital fuels and lubricants, so all-important to mechanized warfare. Secondly, we must be able to meet the petroleum demands of those industries engaged in the manufacture of wartime necessities. Finally, we must strive to maintain our established standards of service to our civilian customers.

Undoubtedly the greatest contributions the industry has made to the war effort to date have come about as a direct research of extensive and farsighted petroleum research carried out prior to the present emergency. As exemplified by the development of 100-octane aviation gasoline, toluene, and synthetic rubber, the industry's research program will play a decisive role in providing the Government with superior war materials.

The task that lies before us is not an easy one. Yet the fruits of our past and present endeavors now being applied to the war program will stand the nation in good stead long after we have achieved final victory.

Stripper Wells Must Operate At Most Efficient Capacity

By A. H. LEDBETER
General Manager, McClanahan Oil Co.

THE stripper-well production of this country has long been recognized as the backbone of the petroleum industry. At the present time, there are approximately 300,000 stripper wells. The operation of these wells provides employment for many thousands of workers. The investment in this branch of the industry is tremendous. It is, therefore, important to the welfare of our country, and in the interest of national defense that these wells be operated at their most efficient capacity.

During the past year, the stripper-well operators have been faced with many adverse conditions. It has been found necessary to put through labor increases, and the cost of materials and supplies has increased very materially, all of which has brought about a considerable rise in lifting costs. While there has been a slight increase in the price of crude oil, this has not compensated the operators for their additional expense. Also, the operators have been faced with the natural decline in production from their wells.

The stripper-well operators should be protected to the point where they are enabled to make a fair return on their investments. This can only be accomplished by their obtaining an adequate price for their crude oil. It is also very important that the depletion allowance of 27½ per cent be sustained, as it is only through this medium that they derive funds which they are enabled to allocate to the finding of additional reserves in order to continue in business.

Within the past few months, a concentrated effort has been made by the stripper operators to secure a higher price for their crude oil. This matter has been brought to the attention of the proper authorities and it is hoped that immediate action will be taken to remedy an unfavorable condition which affects the interests of so many people of our country.

Will Supply Petroleum to Meet Any and All Demands

By J. D. TRIMBLE
Bailey & Trimble

IN this our supreme national emergency, the nation finds our industry in a state of readiness. This situation, achieved all within the past decade, heads up in the following state of facts:

A supply of petroleum equal to any demand of the nation and its allies, at prices currently below even the normal peacetime levels, all produced—not from open-flow methods—but from underground reserves at production rates within the soundest formulas of engineering efficiency. All achieved, not without some "dust and heat," through the developing processes of state regulatory action, supplemented by the auxiliary and remedial federal arm.

This progressive experience, which none has entirely and beforehand envisioned in all its parts, has been the reward of faith, of patience and practical labor of believing men, in the application of common sense and legal aids available under our dual form of government. The men of the oil industry, knowing how to value such an accomplishment, from its proven utility to meet the old and its efficacy to meet the problems ahead, will wish on this occasion to renew and reaffirm their confidence in and affection for our experimented form of representative republican government for these United States.

Operations Should Be Carried On Through State Commissions

By E. B. REESER
President, Barnsdall Oil Co.

THE recent order of the OPM designated as M-68 shocked the production department of the industry. We were promised a modification of the order, and were hopeful that the criticisms and appeals of the industry would bring about a reasonable modification of the order. In this, we were terribly disappointed through the new order issued on January 13. Efforts of the industry to secure a change in the well-spacing requirements or the definition of an exploratory well—which under the order required it to be at least 2 miles from a producing well—proved futile.

If this order was created and issued for the purpose of conserving steel, we have no complaint to make. If, however, the order is based on the theory that one well on 40 acres in proved territory, and exploratory wells located at least 2 miles from the nearest producing well, are supposed to be in the interests of conservation, then we emphatically protest. Practical operators know that the low price of crude oil requires them to select drilling locations with the utmost regard for economics and if one well to 40 acres were a sound and sensible practice, they would have adopted it long ago. There are many reasons why one well to 40 acres cannot be adopted as a general policy.

Mr. Ickes, as coordinator of the petroleum industry, has surrounded himself with a group of exceptionally well-trained men in the various departments of the industry. I believe, however, that the petroleum industry could and would function to a much greater efficiency if the operations were carried on through the commissions of the several producing states. They are in close touch with local problems and much better qualified to decide whether a well should be drilled on a 10, 20, or 40-acre spacing order than any other office of remote control can do. The coordinator could hold the power of veto but otherwise the commissions should continue to exercise their authority. The coordinator should continue his efforts to control operations in those states where no legal authority exists.

Negligible Amount of Refinery Capacity Not Producing

HENRY D. MOYLE
Vice President, Wasatch Oil & Refining Co.

THE oil industry is operating on a war basis. Such a change could not have been effected in a month and one-half had the industry not been prepared. If each company had not been taking care of its own needs and kept its equipment in first-class condition, we would not have witnessed an overnight change into full capacity war production. Operating on a war basis means efficient operation with no red tape or waste.

For the past 18 months most refineries have been producing at near capacity due to the increased demand for petroleum products. Surveys for the country show that there is very little shutdown refining capacity within the industry, and that which exists is obsolete and should be scrapped.

Since oil is the lifeblood of a fighting nation, the refineries in the United States will play as important a role toward winning the war as will the manufacturers of tanks and planes. In fact, without the superior fuels which the industry itself has developed through expensive research and keen competition, tanks and planes are useless.

Of course the refineries should receive no more credit than the other industries which contribute vitally to our war efforts, but since petroleum plays such an important part, refiners should be given credit and congratulated on being prepared for the present emergency.

In all branches of the industry is present a keen interest to cooperate and do everything possible to assist in the defense and war program. Several smaller refineries have offered to turn their plants over to the Government, and

if the need arises, the entire industry will gladly produce 100 per cent for the United States.

The refining branch of the oil industry is prepared to do its part in winning the war.

California Industry Faces Its Most Difficult Year

By DANA HOGAN
President, Hogan Petroleum Co.
Los Angeles, Calif.

ANY statement made today regarding the 1942 outlook of the oil industry in California would be subject to rapid change due to unforeseen developments of the war.

It appears from the federal administration's recent statements that our 1942 war efforts are to be concentrated in Europe, which may mean leaving the Pacific situation in the hands of the Japanese for the balance of this year. This may mean that California will lose the greater portion of its export civilian business as ocean transportation of petroleum supplies to Oregon, Washington, British Columbia, or elsewhere is going to be dangerous.

At present the production of oil above 30 gravity is much larger than the production of oil below 30 gravity, but the demand for the products refined from the lower gravity oil, particularly fuel oil, is increasing rapidly while the demand for products from the lighter gravity oil is decreasing. This is going to cause a dislocation of the present system of well production allocations practiced in California, which has been based on the ability of a well to produce and not on the quality or demand of its oil.

It also appears likely that we may expect this year bombing and/or shelling of our oil refinery and transportation facilities in the Los Angeles and San Francisco Harbor areas.

For the foregoing reasons the year 1942 would appear to be a most difficult and severe year for the oil industry in California.

Supply Restrictions, Price Ceiling, Industry's Cross in 1942

By C. P. McGAHA
President, National Stripper Well Association

MANY and complex are the problems which confront the oil industry in 1942.

First—there will not be available to the industry the amount of steel necessary to carry on its normal operations. This means that fewer wells will be drilled and this will result in a declining rate of new discoveries, necessitating a heavy draft on our known reserves.

Second—the industry will be compelled to operate under an artificial price ceiling. An inadequate price for oil destroys the incentive for wildcatting and also shortens the economic life of small wells, resulting in their premature abandonment. The price "bottleneck" will mean no increase in reserves and at the same time a loss of part of our valuable and much-needed reserves due to well abandonments.

Third—the industry is faced with the very definite threat of having Congress eliminate all or a substantial part of the 27½ per cent cost depletion allowance. This would be a grave injustice to the oil industry. Its financial structure would be seriously inpaired and its operations materially slowed down at this very critical time when the oil industry should be encouraged to accelerate its activities, especially since its products are so vitally needed to propel the machines of war.

But in spite of these handicaps and these difficulties the oil industry will carry on. Our country is at war—engaged in a life-and-death struggle for self-preservation. Oil men will meet their responsibilities and do their part in this all-out effort for self-defense.

Pennsylvania Producers Enjoy Excellent Cooperation

By PARKER L. MELVIN
President, Pennsylvania Grade Crude Oil Association

NO well-informed oil man will attempt to predict even a few weeks of the future. The swiftly changing situation abroad and in Washington makes forecasting almost useless.

Producers in the Pennsylvania Grade region, like many others, are handicapped by a price ceiling which, for most of the crude, is below cost. Nevertheless, they recognize that a substantial part of the refined products from their oil goes immediately into combat service or to war industries and they are expending every effort to hold production to its topmost limits.

Labor, taxes and materials continually increase the costs of production but probably at no greater rate than elsewhere in the petroleum industry.

Refiners are hard put to supply even a major portion of their civilian demand but strive to retain the best of their markets after meeting wartime requirements. Their costs, too, except for crude, are steadily rising.

The Pennsylvania wing of the industry has enjoyed excellent cooperation from the Office of the Petroleum Coordinator and our representatives on the various committees are laboring faithfully to serve the national need promptly and effectively.

No one risks an estimate of what the future will bring; there is a war to win and all other considerations are incidental.

Let's Keep 'em Pumping In 1942

By CHARLES J. TUCKER
Vice President, Tucker Oil Co.

FOR 1942 the outlook for "Lazarus," the small stripper-well operator, is pathetic and gloomy. It should be explained, because it is not generally known, that Lazarus' oil is produced by the sweat of the brow in grease and grime, and a little at a time; while his rich and lucky competitor, "Dives," toils not, neither does he spin; the valves are opened and the oil gushes in.

Lazarus, throughout the oil fields of this continent, is a symbol of patience, toil, self-sacrifice and ingenuity, for he keeps his small wells going with material long discarded by Dives. His oil leases have a look of desolation, but underlying these properties are vast and priceless reserves of crude oil, to be needed so desperately in the future by this nation. These reserves should be conserved for the use of posterity, but today they are in grave danger of being lost by premature abandonment because of price policies formed by government agencies without the blessings of wisdom.

Yet to be fully achieved, but devoutly to be hoped for, and so important to this nation, is the full and complete cooperation, conservation, regulation and coordination of all branches of the industry, so that Lazarus may be permitted to continue to take his part in his great work under conditions removed from want and threatened bankruptcy.

Under the stripper-well leases of America lie petroleum stores vast enough to send the armies of other nations rolling to bloody conquest. It would be a tragic mistake to lose these sources of power by failing to allow the small-well operator, or the industry as a whole, a living wage for its production. The stripper-well operator is ready to cooperate with the industry and with the nation in the fight for the American way of life.

Let's "keep 'em pumping" in 1942.

Spacing Program With Exceptions Beneficial to Industry

By HARRY S. MOSS
President, H. S. Moss Petroleum Co.

THE petroleum coordinator in cooperation with the Office of Production Management, has put into effect a 40-acre oil-well and 640-acre gas-well spacing program through restriction of drilling materials. For the first time in its history, the petroleum industry has a national well-spacing program worked out on an economic acreage basis. And I do not think the oil industry need abandon any of its opposition to permanent federal control after the emergency to concede that this spacing regulation is a tremendous step forward and one which has long been needed.

Efforts toward a reasonable spacing program have been exerted for years by some of our state regulatory bodies and commendable progress has been made. But frequently changes in official personnel, political expediency or short-sighted pressure by the operators themselves hampered if they did not nullify such attempts.

Today all that is over. With reasonable discretion by the federal authorities in the application of the rules to individual fields, and with granting of exceptions where structure or other conditions make these necessary, the oil industry at last will have an all-over sensible spacing program. Unitization (which in several voluntary instances has proved its great advantages to conservation) becomes not merely possible but mandatory where small tracts are involved, to stop the endless round of offset drilling. The proper number of wells to develop and produce a field most economically will be drilled, and no more. It is one of the most helpful steps yet taken toward the economic and efficient operation of our industry.

Whatever else may come out of federal regulation, this spacing program (if properly administered) alone can make up for any inconveniences which we as individual operators may suffer.

PERSPECTIVES

Conversion of the petroleum industry to a shooting-war economy has precipitated revolutionary changes in operations and even more far-reaching transitions are in prospect. This "futurama" of the oil industry is an examination of the trend ahead based on events of the past which indicate many of the 1942 requirements

1—Railroads are to play an unprecedented part in the modern-transportation era of the petroleum industry this year. A third to a half of the American tanker fleet has been or may be assigned to noncivilian services. Hauling capacity of marine equipment is likely to be restricted by protective measures on both coasts. Another factor is the tire scarcity. Operating radius of tank trucks will be curtailed. Forty East Coast tankers have been transferred to the Pacific, others may be needed if the Netherlands East Indies fall.

Rail movement of petroleum into eastern seaboard states reached a peak of 143,000 bbl. daily during the first half of last October just before the British returned 40 of the 80 American tankers that had been on lend-lease assignment. A new appeal was issued 2 weeks ago by the OPC, urging the petroleum industry to make maximum use of railroad tank cars to maintain supplies in the northeast and northwest parts of the country where chief dependence in the past has rested upon marine facilities. Five tankers have been sunk and one seriously damaged along the Atlantic Coast in the past 2 weeks, indicating the extent of the menace that may drive larger percentages of petroleum traffic to overland routes.

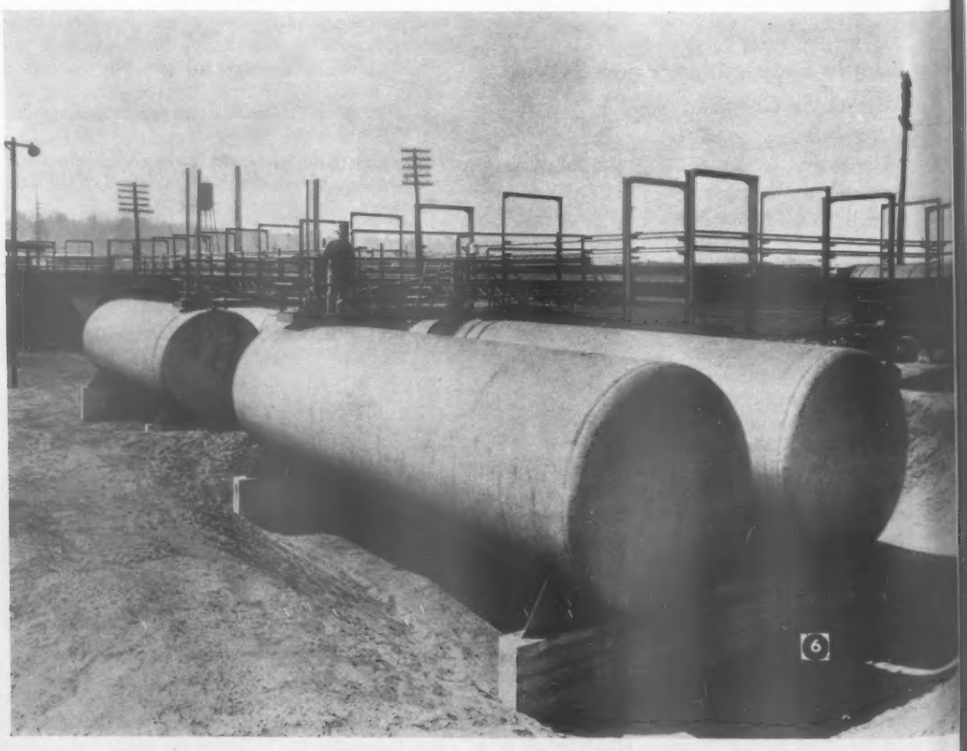
2—Wooden barrels thumped back into the oil industry's packaging practices after years of almost complete absence. Sixty per cent of the steel normally required for barrels is now diverted. Alternate materials appear certain to displace much steel for oil containers until war ends.

Minimum deposits on steel drums and barrels, graduated according to weights and sizes, have been instituted at the recommendation of the OPC marketing division. Limitations have been imposed on the number of quart sheet steel cans in relation to bulk-package distribution. Other limitations on marketing, particularly those stipulated in Conservation Order M-68, presage tightening up of practices in numerous phases.

3—Need for a direct line of communication between the industry and the federal agencies which are exercising various influences over operations is becoming increasingly acute. Medium of contact was created in the form of the Petroleum Industry Council for National Defense. The council is composed of nearly 70 representative oil men from all factions. W. R. Boyd, Jr., elected president of the A.P.I. last year, was chosen chairman of the council.

Functions of the PIC are chiefly concerned with assembly of data on conditions within the industry for transmittal along with recommendations to the OPC. The executive committee is composed of 25 key men in addition to Mr. Boyd. The executive committee meets monthly in Washington, D. C., for a discussion of general conditions, particularly those that constitute common problems to the general industry. The first detailed study launched by PIC is a survey to determine measures for the prevention of waste in the use of petroleum. Another subcommittee is investigating the effect of abandonment of stripper wells.

4—Petroleum Coordinator Ickes, shown in a characteristic pose addressing oil men in Washington, D. C., is expected to continue in this capacity under the War Production Board. He has served as coordinator since May 31, picked Ralph K. Davies, former vice president of the Standard Oil Co. of California, as his chief deputy; divided the country into five districts; organized one general and



OF PETROLEUM

four functional committees of oil men in each and created branch offices reporting direct to OPC from five cities within the regions.

The coordinator's Washington staff consists of about 80 key men in the various divisions of the industry. District staffs in the five regions into which the nation has been divided have not been completely organized. Additional functions imposed on the district offices by provisions of Conservation Order M-68 have caused operating interests to urge speedy completion of staff organization. If recommendations of the industry are followed, the district offices will carry the burden of first clearance on applications for exceptions to M-68, a task in itself which will require a full complement of employes.

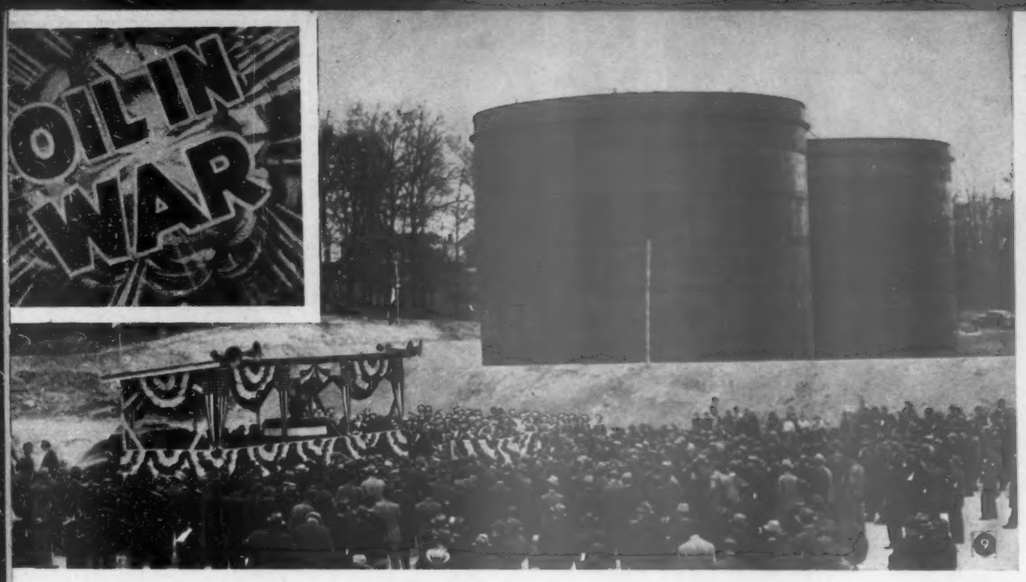
5—Influence in oil-industry affairs that has transcended that of Coordinator Ickes in several respects will remain in the hands of Leon Henderson, price administrator. He clamped ceilings on many local oil prices through earlier 1941 months, imposed a blanket market ceiling in November and closed the year with a drastic rationing order on civilian automobile tires. He followed up this month with an order freezing all new cars in stocks of manufacturers, distributors and dealers.

Promised by OPA in the near future is a complete price schedule on petroleum products. Most of the price regulation so far has been based on a rather instable foundation, lacking precise clarity in some cases and practically nothing more than generalities in others. This week Mr. Henderson indicated that a complete price schedule will be issued in the near future. Oil men placed a significant interpretation on authorization to increase gasoline prices in 17 eastern states issued last week. When companies in that area started increased use of higher-cost rail transportation last spring, promises were made that more-expensive operations would be adjusted by price considerations. The gasoline advance of 0.3 cent per gallon authorized by Mr. Henderson was accepted as evidence that other adjustments may be justified as operating costs increase.

6—The herculean task of producing butadiene and other hydrocarbon components in sufficient quantities to manufacture 400,000 tons of synthetic rubber annually is another war job pitched into the lap of the oil industry. Here is an installation at an Ohio rubber factory where butadiene is stored, later manufactured into latex and products. Delivery from southwestern refineries is made in tank cars. The synthetic-rubber program envisages total outlay of $400,000,000.

Detailed studies of the hydrocarbon content of refinery-still gas, natural gasoline and natural gas are being made by the industry under direction of the OPC to determine the volumes of raw stocks available for synthetic-rubber production. Contracts with the Government, patterned along the lines of those covering 100-octane gasoline, may evolve from negotiations now under way. Experimental work of converting butadiene, styrene and other petroleum hydrocarbons into synthetic rubber had been completed by the oil industrial technicians and the processes had been reduced to commercial standards before the Pacific invasion developed. Commercial production of butyl and buna types of synthetic rubber has been under way on a limited scale for many months. Plants are now under construction that will lift production to nearly 50,000 tons annually.

7—Jampacked development such as shown here has ended for the duration. Multiple-zone



completions through a single well will increase. Forty-acre development patterns are decreed for oil fields, 640-acre spacing in gas fields.

Contentions are growing more numerous that 40-acre spacing patterns will not efficiently drain many of the common types of structures from which United States fields produce. More than 50 applications for exceptions to the wider spacing ordered in M-68 have been filed daily in one of the five district OPC offices. Petitions are reaching the other four in almost equal volume. The impression is circulating that exceptions to the order may be difficult to obtain, although the OPC has pledged sympathetic consideration for all legitimate applications.

8—Conversion of a substantial portion of the natural-gasoline industry to maximum production of butanes, the group of hydrocarbons most adaptable to preparation of 100-octane gasoline and synthetic rubber components, is insisted upon by the OPC. Machinery for accomplishment of objectives comes through denial of materials for plants failing to qualify under maximum standards of butane recovery. Manufacturers are installing auxiliary equipment in old plants and following government recommendations in design of new units, a trend that will be accelerated this year.

Certain to suffer curtailment of its unprecedented expansion in recent years is the liquefied gas industry. Butanes normally liquefied and distributed to all parts of the country for domestic and industrial consumption will be unavailable for that purpose at least to anything like the extent that has prevailed during recent years. Restrictions have been imposed on the use of metals necessary to manufacture consuming units for liquefied gas and the prospects are that these limitations will severely modify the increase in installations, more probably peg them about where they are.

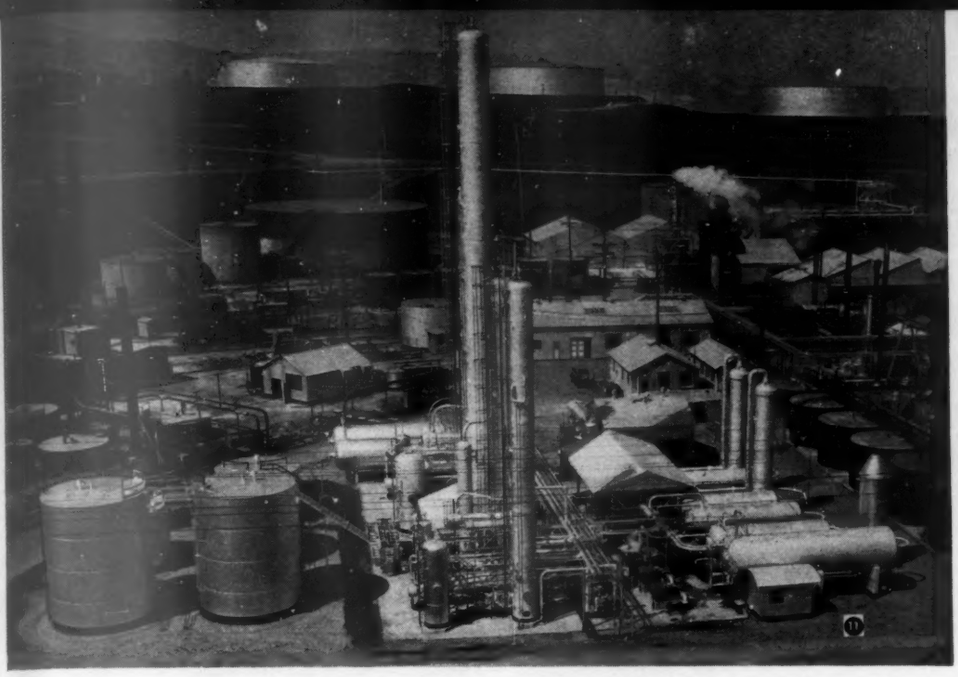
9—Pipe-line construction became more intimately related to war plans to attain oil-transportation security. Probably for the first time in the history of the petroleum industry, completion of pipe lines became a strategic accomplishment and an occasion for national celebration. Here, a defense line is dedicated.

More acute need for steel in manufacture of other defense and war materials blocked fruition of the most ambitious 1941 pipe-line project, consisting of a system that would have linked East Texas and intermediate fields with the Atlantic Coast refining centers in Pennsylvania, New Jersey and New York. The line is again under discussion and may be hastened by coastwise transportation impediments.

10—Obstructions that were previously almost insurmountable in procurement of pipe-line

easement through certain states are now eliminated. Vehicle for overcoming objections of railroads was the Cole pipe-line law which empowers companies to condemn right-of-way upon presidential declaration that the artery is indispensable to defense. Here Representative Cole, chairman of the House subcommittee on oil, on the right, helps a Southeastern Pipe Line Co. operating man and Capt. Eddie Rickenbacker open the gate on the products system between Port St. Joe, Fla., and Chattanooga, Tenn. Other victory lines, in addition to Southeastern, Plantation and the Portland-Montreal systems are certain to germinate.

11—Alkylation units, another necessary phase in producing 100-octane gasoline, will receive even more concentrated attention of refiners in future months. Government agencies are to complete commitments for 100-octane fuel, aid the industry in financing installations.



More than $75,000,000 has been appropriated by government and industry in recent weeks for plants capable of producing nearly 40,000 bbl. of 100-octane gasoline. A similar sum remains to be appropriated for the total program of producing 150,000 bbl. daily.

The unit pictured is one of five alkylation plants of Shell Oil Co., Inc., now producing 100-octane gasoline. Efforts have been concentrated on construction of alkylation units in larger refineries where charging stocks are most abundant. This year will bring a spread of construction of such units to refineries with intermediate capacity in order to make complete use of available hydrocarbons. Government is contracting with refiners for the maximum production of 100-octane motor fuel for an initial term of 3 years. Agreements provide for prices that will permit liquidation of the investment in the primary term. Government retains option to extend the contractural period for 2 years, making a total of 5 during which all 100-octane fuel production is committed to the war program. Prices in recent contracts range from 13 to 15 cents per gallon for the first year and decrease to a spread of 11 to 13 cents thereafter.

12—Scope of 1942 drilling is still in doubt. Steel requirements for war equipment, said to be the real basis for Conservation Order M-68 which restricts drilling, may force a reduction in the OPC goal which remains officially at 30,000 wells for 1942. Some industry analysts anticipate reductions. Others contend petroleum requirements will preclude any major reduction in drilling.

13—This refinery, typifying those in the Netherlands East Indies, has been, along with others, processing upward of 150,000 bbl. daily. Spread of war into the South Pacific has resulted in destruction of refineries in Sarawak and Borneo having combined capacity of 60,000 bbl. daily. Others may be lost, certainly their effective operation curtailed. Prospects are that the United States will be forced to supply practically all Allied oil requirements in the Far East.

If developments require extension of oil-field and refinery demolition in the East Indies, the logical source from which to draw Allied oil requirements for the Pacific warfare would be California. Exports from California to Japan were terminated July 26, 1941. During the earlier months of last year shipments from Pacific Coast ports to Nippon had averaged 46,500 bbl. daily.

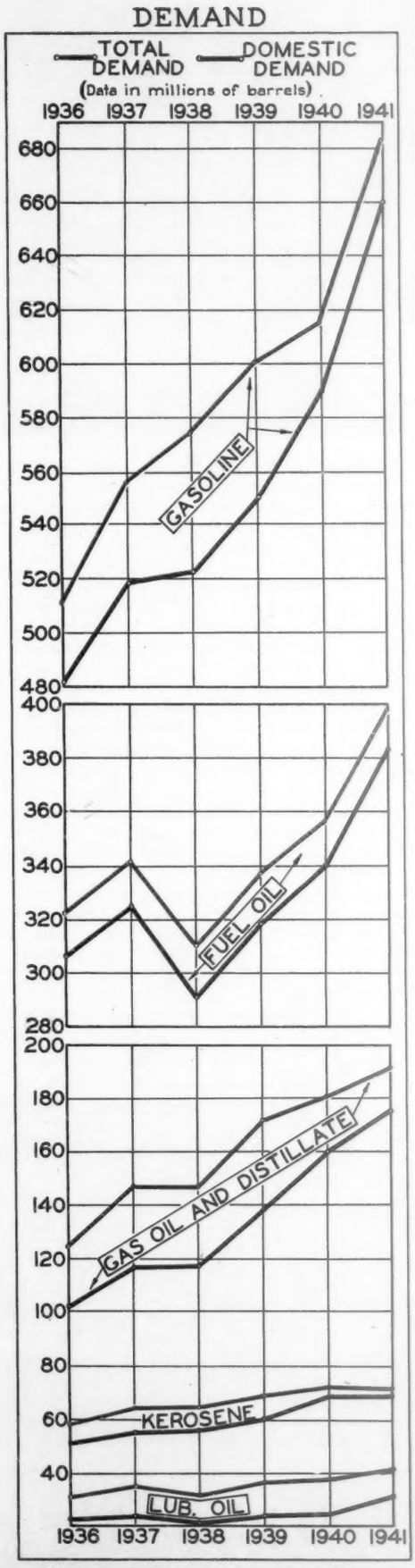
14—Trucks, jeeps, peeps, artillery transports, all other forms of motorized war machines will require full facilities of automobile manufacturers, much of the rubber supply, high-quality fuels and lubricants.

High octane fuels are specified for all military equipment. Army specifications were revised to permit addition of 4 cc. of tetraethyl lead in 100-octane fuel during middle of last year. Motorized land equipment operates on 87 and 91-octane fuels, constituting another drain on civilian quality gasoline. Most regular fuel retrogressed in quality as a result of tetraethyl shortages to a maximum of 72 octane.

15—Fuel for mechanized warfare is the No. 1 assignment of the oil industry. The war program, calling for 60,000 airplanes, 42,000 tanks and 8,000,000 tons of ships in 1942, requires many special fuels. Armament schedules spurt to 125,000 planes, 75,000 tanks and 10,000,000 tons of ships in 1943. Steel and other materials denied the industry are earmarked for fulfillment of this plan.

THE PICTURES

(2) Wooden barrels, *Socony-Vacuum News;* (5) Leon Henderson, *Harris & Ewing;* (11) Alkylation plant, *Shell Oil Co., Inc.;* (13) East Indian refinery, *Three Lions;* (14) Army transport and (15) maneuvers, *U. S. Army Signal Corps.*



The gain in domestic gasoline demand last year as shown in chart was approximately twice that of an average year. The expansion in outlets for residual fuel oils was also exceptionally large

War Developments Will Determine 1942 Demands

By C. O. WILLSON

IN late November this publication, based on known conditions at that time, and after consultation with several of the industry's leading economists, projected 1942's demands for crude oil and refinery products. This analysis pointed to an over-all increase of 7 per cent in demand for producers, refiners, and importers of this country over the record-breaking year which was being brought to a close. The estimated gains in total demands for the principal refinery products in 1942 over 1941, were: Motor fuel, 8 per cent; residual fuel oil, 6 per cent; gas oil and distillate, 7.7 per cent; kerosene, 4 per cent; lubricating oil, 9.4 per cent. The total gain for these five classifications was 90,000,000 bbl., or 6.4 per cent.

If the series of events which started with Pearl Harbor on December 7 could be eliminated from consideration the November estimates would still hold without substantial revisions and the industry in this country, including importers, could be told to be prepared for a demand of at least 1,675 million barrels with the consumption of its principal product—gasoline—to exceed 2 million barrels daily.

The accuracy of this November estimate was indicated by January developments. Current reports reveal that January requirements exceeded the same month last year by at least 9 per cent. The estimated demands for domestic crude oil in February as compiled by the Office of Petroleum Coordinator point to a demand next month which is in line with the November projection.

Revision Necessary

The industry's statisticians agree that developments over the past few weeks will necessitate revisions in 1942 estimates after February or earlier. The November figures took into consideration that the manufacture of new motor vehicles, starting January 1, would be largely confined to military and essential civilian uses with the production during 1942 to be at least 75 per cent under the near-record output of 1941. This meant that this year's output of new cars would be less than the junking of old cars, a development which would tend to level off the domestic gasoline-consuming curve later in the year. It was estimated that the gain in domestic gasoline consumption this year would total 48,000,000 bbl., which compares with the 70,510,000-bbl. increase in 1941 over 1940. The 1941 increase was far greater than any previous year.

The most important change in 1942 demand outlook has been brought about by the Government's rubber-rationing program. Statisticians in recent years have been able to estimate demands for the various products with remarkable accuracy. For example, estimates covering gasoline consumption by months for certain areas or for the entire country, and which took into consideration expected motor-vehicle production, general business levels, and other factors, often proved accurate within a fraction of 1 per cent.

Rubber rationing presents new factors, the importance of which is difficult to determine in relation to domestic gasoline consumption. Assuming that the present rubber order is not liberalized as to its provisions, most observers agree that it will have gradually increasing influence on motor-fuel consumption. The estimates as to the reduction for the entire year vary widely showing that those making the studies are not in agreement as to immediate and long-range effect of restrictions of tire sales for motor-car use.

One detailed analysis applying to the entire country concluded that for 1942 the rationing of the sale of tires to civilians would reduce gasoline consumption 8 per cent under 1941. This estimate assumed that sales of tires to civilians would be confined to retreads and recapping with

TABLE 1—PETROLEUM DEMAND 1940-1941

(Data in barrels)

	1940	*1941	1941 increase per cent
ALL OILS			
Domestic demand	1,326,620,000	1,483,161,000	11.8
Exports	130,466,000	103,000,000	—21.0
Total demand	1,457,086,000	1,586,161,000	8.8
Crude runs to stills	1,294,162,000	1,404,165,000	8.5
REFINERY PRODUCTS			
Motor fuel:			
Domestic	589,490,000	660,000,000	11.9
Exports	25,377,000	22,750,000	—10.3
Total demand	614,867,000	682,750,000	11.0
Kerosene:			
Domestic	68,776,000	69,500,000	1.0
Exports	3,374,000	2,400,000	—28.8
Total demand	72,150,000	71,900,000	—.3
Gas oil and distillate:			
Domestic	160,851,000	176,000,000	9.4
Exports	19,140,000	15,500,000	—19.0
Total demand	179,991,000	191,500,000	6.4
Residual fuel oils:			
Domestic	340,163,000	383,000,000	12.7
Exports	16,109,000	14,000,000	—13.0
Total demand	356,272,000	397,000,000	11.4
Lubricants:			
Domestic	24,690,000	32,000,000	29.5
Exports	10,461,000	8,600,000	—17.7
Total demand	35,151,000	40,600,000	15.5
Wax (lb.):			
Domestic	356,653,000	517,146,000	45.0
Exports	190,065,000	161,556,000	—15.0
Total demand	546,718,000	678,556,000	24.3
Natural gasoline	54,417,000	62,035,000	14.0

*November and December partially estimated.

new-tire sales restricted to the military and essential transportation operations. It was also assumed that speeds would be restricted to 40 m.p.h., or less, a development which would have an important bearing on gasoline consumption per mile. According to this survey, domestic gasoline consumption in the United States in 1942 will total approximately 600 million barrels instead of the 700 million barrels which was the previous estimate based on an increase of 8 per cent this year. The 100-million-barrel reduction would mean a loss in demand at refineries and service stations of 275,000 bbl. daily for the year. This survey indicated that the loss during the first quarter of this year would be negligible but would increase rapidly during the summer months due to the decline in tourist business. Toward the end of the year the wearing out of tires which could not be replaced would have a pronounced effect upon gasoline consumption with still greater losses in gasoline consumption assured for 1943 unless the tire restrictions were eased.

Increased Exports

Increased exports probably will provide a partial offset to the expected loss in domestic gasoline markets. Exports of practically all refinery products decreased again in 1941 reaching the lowest levels in 11 years. However, toward the end of the year the export movement of several products, including gasoline, improved. It is believed that this improvement will carry through this year and 1942 estimates of exports are generally higher than the foreign movement of 1941. Several who have analyzed probable gasoline requirements of the Allies expect that the 22,750,000-bbl. gasoline-export movement of 1941 will be more than doubled in 1942. This figure on gasoline and estimates of export shipments of other refinery products, will be further expanded should the Allied powers, in the near future, lose control of the oil fields and refineries of the East Indies to Japan. In that event refiners in this country would be called upon to make up for part of this oil loss in the East Indies where production, previous to December last year, totaled approximately 170,000 bbl. daily.

Military Needs

Many of the industry's students also feel that estimates at the first of the year did not adequately cover the expanded military requirements of 1942. No information will be given out as to these needs. It is certain the rapidly expanding Navy and the increased shipping to all parts of the world will be reflected monthly in greater purchases of residual fuel oil and diesel fuel oils. Reports also indicate that refiners in this country will furnish increasing quantities of petroleum for use by other Allied powers. In this connection present plans call for a production of approximately 150,000 bbl. daily of 100-octane gasoline before the close of this year with refiners here supplying practically all of the aviation-fuel requirements of the Allied powers.

The conclusions from these discussions is that the petroleum industry in this country should adjust its operations to provide for at least a small decrease in domestic gasoline consumption. Because it is impossible to accurately analyze the importance of tire rationing, the industry's economists are recommending that refiners watch actual developments closely and be prepared to make whatever operating changes are necessary from month to month.

In regard to products other than gasoline there does not appear to be any reason at this time why the percentage increases given in the opening paragraph of this discussion should be changed. An expanding demand for residual fuels is an assured result of increased industrial activity of the war program. Diesel-fuel consumption by the military and civilian users will increase. While sales of new oil burners for homes will be restricted there are no plans at this time to limit the use of furnace oils by units already installed. Increased agricultural production will widen the markets for tractor fuel, kerosene and several other petroleum products.

Crude-Oil Requirements

Any reduction in gasoline consumption would be reflected in crude-oil requirements. Refinery operations would have to be adjusted so that products now recovered as gasoline would be refined into heavier products, thus reducing the quantity of crude oil required.

Predictions of last October and November visualized domestic crude-oil requirements of 5 million barrels daily by the end of 1941. This figure encompassed greatly increased shipments to foreign buyers with no restrictions on civilian use in this country, including the expectation that the gain in consumption would be as great in 1942 as it was in 1941. More conservative estimates are now being heard with market students generally stressing the fact that long-range estimates of demand are particularly hazardous at this time.

1941 Demands

Demand trends in 1941, many of which will continue through this year, were a reflection of defense preparations in the United States and the course of the war in other parts of the world. The gain in domestic gasoline consumption was much larger than estimates made at the start of the year. The second largest production year in the history of the automobile industry brought monthly increases in the number of motor vehicles in use. Improved employment conditions and higher wage scales accounted for a greater consumption of motor fuels per car, the increase, according to several analyses, amounting to approximately 50 gal. per car for the year. The 70-million-barrel gain for the year is approximately twice the average yearly expansion in gasoline requirements in this country.

Fuel-Oil Market Strong

The greater industrial activity was reflected in large increases in residual-fuel-oil sales. The enlarged needs of the Navy and other marine outlets were also a factor in the strong fuel-oil market.

The enlarged needs of motor cars and the expansion in industrial sales brought manufacturers of lubricants an 8,500,000-bbl. gain in demand last year. The growth in gas oil and distillate products was average, with only a small gain reported in kerosene. Restrictions in markets of the Eastern Hemisphere accounted for the decline in export shipments from this country in 1941.

Industry's Stock Position Improved in 1941

THE better balance in supply and demand for crude oil and refinery products during 1941 brought needed changes in inventories. During a large part of 1940 crude-oil production and the output of most refinery products were in excess of requirements and excess stocks were accumulated. The year-end stocks of crude oil for 1939, 1940, and 1941, and the principal refinery products are given in the accompanying table. Charts on Page 53 of this issue give the inventory changes in crude oil, gasoline, gas oil and distillate, and fuel oil for 1941.

PETROLEUM INVENTORIES

(Thousands of barrels)	December 31—		
	1939	1940	1941*
Refinable crude oil	239,978	264,079	244,000
Motor fuel†	87,286	84,409	93,000
Kerosene	7,576	9,512	10,100
Gas oil and distillate	33,718	42,940	50,000
Lubricants	7,142	8,767	9,800
Fuel oil	105,620	101,210	96,000
Total all oils	525,838	563,954	552,000

*Estimate. †Does not include natural gasoline.

The improvement in inventories was under way the last quarter of 1940 and the trend continued throughout the first half of 1941. With gasoline prices at refineries in 1940 at the lowest levels since motor fuels became an important product of the petroleum industry, refiners during the latter part of that year adjusted their operations so that stocks at the close of the year were lower than they were at the start. This situation continued through most of 1941. During the latter part of 1941 gasoline stocks increased rapidly and inventories at the close of the year were approximately 9,000,000 bbl. higher than on December 31, 1940.

The most important change in stocks applied to crude oil, including the refinable grades and the heavy grades which are disposed of as fuel oil. In 1940 the industry added 25,000,000 bbl. to crude-oil stocks, a situation which was brought about by a refusal of several states to keep their output within the estimated demands during the early part of the year. Crude-oil stocks were reduced consistently from late March to November, last year. Minor additions to stocks were reported the last few weeks of 1941. Stocks of refinable crude oil were lowered 20,079,000 bbl. during the year.

Based on days' supply, stocks of crude oil and several refinery products are substantially lower than they were a year ago. The stocks of oils on December 31, 1941, in relation to the 1941 demand, represented 127 days' supply. A year earlier the stocks of all oils in relation to the 1940 demand represented 141 days' supply.

While stocks of gasoline were greater at the start of 1941 than they were at the close, inventories on hand December 31, 1941, measured in days' supply were practically unchanged at 50 days. Owing to the increase in stocks and the leveling off in demand, inventories of gas oil and distillate at the start of this year represented 95 days' supply, while a year earlier 87 days' requirements were in tanks.

The largest reduction in volume and in days' supply for the year applies to residual fuel oils. Most of this reduction took place in California. For the entire country, inventories of residual fuel oil were reduced from 104 days' on December 31, 1940, to 88 days on December 31, 1941. Days' supply in all these comparisons is based on stocks at the end of the year in relation to demand for that year.

Production Record Reached in 1941 With Trend Still Up

By W. V. HOWARD

WITH average daily production in excess of 4,000,000 bbl. during the last 3 months of the year, 1941 chalked up an all-time production record of 1,391,544,457 bbl. This is 53,307,319 bbl. or 4 per cent above last year's record peak. The increase in production due to war demands as well as those of rapidly expanding industry is the more remarkable in view of the fact that at the end of the first half year production was 23,393,190 bbl. below that of the same period in 1940, or approximately 4 per cent.

Average daily production for the past 2 years is as follows (in barrels):

First 6 months, 1940	3,762,173
Second 6 month, 1940	3,540,599
First 6 months, 1941	3,654,814
Second 6 months, 1941	3,970,088

The output of Texas continued in the lead, being nearly equal to that of the next three leading states combined. The increase in Texas production was, however, below the average, being only about 1½ per cent. In California, the second state, production rose about 3 per cent, Oklahoma in third place had a 1½ per cent rise, while Illinois dropped about 13 per cent. Thus the four leading states combined, accounting for over 70 per cent of the nation's output, failed to benefit by the increased production. Actually, their combined output was up only 631,000 bbl., or less than 0.6 per cent.

The only other state producing over 100,000,000 bbl. a year is Louisiana, whose production rose 12,281,794 bbl., or about 12 per cent. Kansas, in sixth place, improved even more with a 17,476,196-bbl. increase, or approximately 18 per cent. The seventh producing state, New Mexico, reported a slight decrease, while Arkansas moved up from eighth to seventh place with a 25 per cent increase. Wyoming, with a 16 per cent increase, failed to retain its rank and dropped back to eighth place.

Production of oil in the United States during 1941 amounted to 1,391,544,457 bbl. This was an all-time high, surpassing the record of 1940 by 53,307,319 bbl. or approximately 4 per cent. The combined production of the four leading states, Texas, California, Oklahoma and Illinois, remained practically stationary, the bulk of the increase coming from Kansas, Louisiana, Arkansas and Mississippi.

There were some major changes in the smaller producing states, of which most are probably not of great significance. Indiana had a considerable rise which will probably be temporary as its discoveries did not balance its output. The great expansion of the Tinsley field nearly quadrupled Mississippi's production but Mississippi still remains a one-pool state.

75 Largest Fields

Study of the production record of the 75 largest fields affords some interesting data which may be subject to varying interpretations. Although the lowest in the list produced nearly 250,000 bbl. more than the lowest in the 1940 list, the group as a whole produced over 44,500,000 bbl. less. Despite the fact that 11 of the 75 fields were not among last year's leaders, the group as a whole produced nearly 16,000,000 bbl. less this year than they did last year. Where the 75 leading fields of 1940 produced 58.8 per cent of the nation's oil and this year's leaders produced 56.6 per cent of that oil, this year their output was only 53.3 per cent of the total for the United States.

Practically all of the decline can be accounted for by a single pool, Salem, whose output dropped from 70,734,313 bbl. to 29,538,803 bbl. At the same time four Illinois pools increased their production over 17,000,000 bbl. to 19,832,227 bbl. Of these pools, two, Benton and Johnsonville, had no production in 1940, while Hoodville was just getting under way.

Of the 1940 leaders, 41 were more than 10 years old at the end of the year. The same number is found in this year's list, although not necessarily the same 41 pools. Of last year's leaders, 15 were less than 5 years old, this year 18 are under 5 years old and of last year's new fields five, Centralia, Freeman-Redding, Walker, Eola and University, have fallen below the producing level of the leaders.

Analysis of these facts suggests that the leading fields of the country are not able to take care of any increased demand, that the majority of these fields are more than 10 years old and are, therefore, in the naturally declining stage. This is, of course, not true of the leader, East Texas, but sound practice appears to limit production from this field at about the present level.

In some areas where proration is not as severe as in others, new fields come in, rise to prominence and then decline as rapidly. This state of affairs works well so long as the new fields are discovered. During the past year, four were added by Illinois to replace the one which became just another field, but Michigan found none to replace

PRODUCTION IN THE UNITED STATES—1932 TO 1941, INCLUSIVE

	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	Producing wells 1-1-42	Dly. av. prod. per well (bbl.)
Arkansas	12,529,870	11,449,635	11,359,458	11,138,586	10,697,345	12,181,083	18,357,235	21,364,988	25,807,707	32,336,499	3,027	21.27
California	178,127,794	173,125,420	175,508,566	207,832,131	214,756,327	238,591,887	249,930,003	224,328,365	224,014,262	230,342,488	16,547	38.14
Colorado	1,114,064	914,881	1,130,375	1,555,542	1,612,760	1,578,391	1,324,374	1,401,199	1,401,577	1,732,503	212	22.39
Illinois	4,801,000	4,252,000	4,472,000	4,351,000	4,439,000	7,426,000	22,800,000	91,797,241	146,450,876	128,630,969	23,411	15.05
Indiana	806,000	732,000	816,000	767,000	792,000	821,200	967,800	1,436,000	4,991,768	7,325,970	7,079	9.65
Kansas	35,339,206	41,305,768	45,754,117	53,364,446	57,084,490	69,158,432	58,134,090	59,162,680	64,944,904	82,421,100	21,838	10.34
Kentucky	6,322,000	4,621,000	4,868,000	5,324,000	5,638,000	5,496,500	5,834,300	5,622,000	5,363,671	4,884,200	14,504	0.92
Louisiana	22,467,889	25,629,655	32,478,282	50,286,626	80,807,016	90,427,302	94,955,073	94,229,472	103,522,456	115,809,662	5,100	62.21
Michigan	6,834,000	7,863,000	10,566,518	15,789,905	11,977,063	16,410,751	19,138,932	23,566,406	19,747,968	16,323,581	3,173	14.09
Mississippi	.....	.....	.....	.....	.....	.....	.....	102,918	4,282,318	15,658,485	317	135.33
Montana	2,320,155	2,358,056	3,509,015	4,367,228	5,798,661	5,799,364	4,824,917	5,854,116	6,580,745	7,343,034	1,995	10.08
Nebraska	.....	.....	.....	.....	.....	.....	.....	.....	288,107	1,928,600	69	76.58
New Mexico	12,344,684	13,801,278	16,438,878	20,154,321	26,647,459	38,438,072	36,008,527	37,668,235	38,756,797	38,659,823	3,633	29.15
New York	4,524,000	3,153,000	3,814,000	4,241,000	4,626,000	5,464,500	5,045,200	5,105,000	3,459,882	5,180,400	15,227	0.93
Ohio	4,606,000	4,296,000	4,299,000	4,121,000	3,837,000	3,549,900	3,297,200	3,165,000	3,116,561	3,366,800	31,127	0.30
Oklahoma	149,487,234	178,356,449	178,652,012	182,596,874	200,880,705	223,106,788	169,307,196	153,413,878	149,597,199	155,257,400	54,147	7.76
Pennsylvania	12,395,000	12,677,000	14,572,000	15,899,000	17,041,000	19,173,500	17,449,000	17,354,000	18,603,435	16,658,900	82,980	0.55
Texas	314,378,759	401,808,452	378,233,017	391,592,331	424,396,034	502,967,214	470,760,325	485,339,998	487,637,523	496,100,067	100,975	13.46
West Virginia	3,907,000	3,827,000	4,133,000	3,959,000	3,814,000	3,829,000	3,724,750	3,539,000	3,426,306	3,415,200	9,462	1.01
Wyoming	12,994,748	11,095,729	12,488,995	13,237,765	14,268,839	19,637,218	18,956,277	21,279,956	26,132,076	30,120,776	3,595	22.96
Miscellaneous	5,000	7,000	11,000	43,000	.....	60,000	68,200	53,082	48,000	48,000	200	0.66
Total	785,304,403	901,273,323	903,104,233	990,620,775	1,089,113,699	1,264,117,102	1,200,883,399	1,255,783,534	1,338,237,138	1,391,544,457	393,616	9.68
Daily av.	2,145,640	2,469,241	2,474,258	2,714,029	2,975,720	3,463,334	3,290,091	3,440,503	3,656,385	3,812,451		

Freeman-Redding and Walker, although Reed City promises to do so.

Of the 10 leading fields, 6 show small declines, 1 shows a drop of nearly 60 per cent, 2 show small increases and the tenth, Tinsley, nearly quadrupled its 1940 production. Six of the 10 fields are over 10 years old, all are fully outlined. Since the poor showing of the Trenton at Salem and of the Devonian at Louden was demonstrated they cannot be said to have much chance of deeper production. The only exception is Wilmington where the Ford zone is still largely undeveloped. Deep tests at Long Beach have yielded little encouragement.

More Development Probable

In the second group of nine prospects of long-continued production are somewhat better. The only field in this group which is definitely on the decline is Rodessa. Kettleman Hills is not proving as good a field as was anticipated but still has plenty of oil. Ventura Avenue has the prospect of breaking all records for deep producing zones. The Coalinga extension areas are still not completely drilled. Wasson is nearly fully developed in the upper pay but there are two more below. The Gray County area is really a group of fields rather than a single one, but that is because conditions in the Panhandle have not warranted drilling for the large reserves that are known to be there. That is one district in which dry holes are rare and wells 2 miles from production need not be considered wildcats. Conroe has been held back and can produce much more oil than it does now. The Cowden-Foster area embraces several pools which are gradually merging. Thus 6 of the 10 fields in this group can not only maintain their present rates of production but could increase them easily, provided there is no brake on adequate development.

The third group of 10 pools contains fewer possibilities for increased production. Probably the best chances are in K.M.A., where the Ellenburger has proved prolific and widespread. The K.M.A. lime is estimated to have added 400,000,000 bbl. to the reserves of this field. The Ellenburger shows possibilities of adding as much. Hutchinson County was more closely drilled than Gray County, but still has much undeveloped acreage. Hastings has not received its full development and both Silica and Trapp will probably continue their 10-year-old record of growth and absorption of other pools now considered separate. Neither shows any signs of stopping as dry holes which were formerly considered as limits to the fields turn out to be sinkholes which only limit production from the area they occupy.

The next group, from Griffin-Keensburg to Tom O'Connor, are probably fully developed with the exception of Santa Maria Valley and Tom O'Connor. Yates, however, has been strictly prorated from its discovery and pressures are being maintained with a view to keeping up the flowing life of the wells almost throughout the life of the field. Yates is an excellent example of the type of field where production could be greatly stepped up merely by turning valves as well as of the fact that the operators in the field are aware of the damage that would be done to the reservoir by this action.

In the next group, Cut Bank is still being extended, new pays can apparently always be found at Jennings; Bemis, like other Kansas pools, is capable of much lateral extension. It is not probable, however, that production from any of these fields could safely be expanded to any extent. With the exception of Clay City and Hewitt, which will probably decline, and Slaughter, which will rank alongside of Wasson before long, the next group consists of stayers which will be found among the leading fields for several years and at about the same levels. In the final 16 pools, Dundas and Hoodville will probably follow the course of unprorated pools and drop out of the list within a year or so. Ventura-Newhall is an old timer with many individual pools between which many others are being found and more will be found in the future. Fitts is about through as a major producer and Earlsboro, South Ward and McCamey appear on the way out of the list of leaders.

Balancing the probable course of all of these fields, some with chances of expansion, others so severely prorated that an increase in production would not be unsound, others steady long-term producers and still others declining rapidly, it appears as if the nation will depend even less on its ranking fields in the future than it does today. It even appears as if the 75 leading pools of 1942 will not produce even half of the nation's oil unless new pools are found to take their places. These new fields will be only of temporary value unless they are long-time producers with reserves in the hundreds of millions of barrels. Where are they to be found?

Michigan has not yet had a 100,000,000-bbl. field and Reed City, although one of the best, does not qualify. Illinois has had two, Louden and Salem, of which the latter is definitely on the decline. In Oklahoma, Apache and Cumberland are the two nearest approaches to major fields that have been found in recent years. Kansas has prospects of another of the order of Silica, Trapp and Bemis in the Zenith-Peace Creek sector in Stafford and Reno counties. In the hundred or more discoveries of the past 2 years in North and West Central Texas no Rangers, Electras, K.M.A.'s or even Noconas have shown up as yet. Hawkins is East Texas' candidate for honors.

The Smackover lime area of Arkansas and northern Louisiana could easily produce another Magnolia or even a Smackover and the new discovery in northern Lafayette County has extended the area of possible Smackover production. The Wilcox trend from the Mississippi River in northern Louisiana to the Rio Grande has not only considerable promise but a good record of performance as well. The trends in Southwest Texas are not as definitely separated as was formerly thought and multiple-sand fields in this sector are attaining greater importance. In this same section large gas-distillate structures have been found to have flanking oil zones and the extent of these zones is not yet known even at Agua Dulce-Stratton where there has been most development.

Granted a market, Wyoming is capable of producing much more oil and has enough in sight to maintain its present production for many years if development continues. California needs a new pay or a new producing area before it can duplicate its past record of more oil from fewer fields than any other sector. Possibly the Cretaceous or the northern San Joaquin Valley will provide the necessary discovery. West Texas, also, needs the same factors. The Ellenburger may prove as prolific as the Permian as some believe. Other Permian basin enthusiasts pin their hopes on the northern part of the basin while still others believe that the Delaware sand discoveries in the western part of the basin may develop production of major importance. The record of West Texas to date suggests that the enthusiasts are more nearly right than the pessimists and this area shares with the Eocene Wilcox the best-known possibilities of major discoveries within the next few years.

PRODUCTION—75 LARGEST FIELDS

Field—	1941	1940
East Texas, Texas*	130,636,770	139,143,831
Oklahoma City, Oklahoma*	32,183,700	35,970,314
Wilmington, California†	30,682,198	30,231,750
Salem, Illinois	29,538,803	70,734,313
Louden, Illinois	22,918,346	26,595,650
Midway-Sunset, California*	17,468,113	18,400,180
Bradford-Allegany, Pa.-N. Y.*	17,231,070	17,668,870
Eunice-Monument, New Mexico	16,016,336	15,312,385
Tinsley, Mississippi	15,564,042	3,995,174
Long Beach, California*	14,712,021	15,995,238
Coalinga, Calif.	14,222,443	9,934,521
Kettleman Hills, California*	13,986,676	16,720,517
Wasson, Texas	13,169,988	11,063,615
Ventura Avenue, California*	12,882,126	12,572,804
Gray County, Texas*	12,506,265	12,005,623
Conroe, Texas†	11,747,119	9,303,006
Cowden-Foster, Texas*	10,837,845	7,783,895
Huntington Beach, California*	10,755,232	9,493,458
Rodessa,Tex-La-Ark*	10,451,199	14,165,845
K.M.A., Texas*	10,224,104	11,496,885
Hendrick-Kermit, Texas*	10,009,846	10,161,158
Hutchinson County, Texas*	9,805,140	8,815,777
Talco, Texas	9,002,414	8,720,798
Lance Creek, Wyoming*	8,918,731	9,200,356
Santa Fe Springs, California*	8,559,187	9,441,971
Dominguez, California*	8,505,983	7,566,914
Hastings, Texas†	7,816,688	5,500,282
Silica-Raymond, Kansas*	7,614,700	5,763,799
Trapp-Sellens, Kansas*	7,576,700	5,480,955
Griffin-Keensburg, Ill.-Ind.	7,311,987	5,530,717
Magnolia, Arkansas	7,117,752	7,402,317
St. Louis, Oklahoma*	6,997,400	9,330,579
Santa Maria Valley, California*	6,925,423	6,161,770
Yates-Tobarg, Texas*	6,719,218	7,693,804
Ville Platte, Louisiana	6,047,100	4,453,876
Schuler, Arkansas	6,026,112	6,609,747
Johnsonville, Illinois	5,912,913	.....
Benton, Illinois	5,769,032	.....
Tom O'Connor, Texas†	5,674,691	5,820,819
Smackover, Arkansas*	5,354,547	5,628,013
Cotton Valley, Louisiana*	5,279,013	5,161,678

Field—	1941	1940
Ten Section, California	5,236,827	3,517,421
Salt Creek, Wyoming*	5,075,668	5,314,209
Jennings, Louisiana*	5,027,896	5,493,439
Cut Bank, Montana†	4,996,880	4,003,231
Montebello, California*	4,894,900	7,239,899
Inglewood, California*	4,893,103	4,368,839
Old Ocean, Texas†	4,882,860	4,150,434
Bemis-Shutts, Kansas†	4,865,700	3,651,655
Hewitt, Oklahoma*	4,860,000	1,778,272
Golden Meadow, Louisiana	4,834,791	4,009,487
McElroy, Texas*	4,819,290	5,096,031
Slaughter, Texas†	4,808,099	1,182,138
Vacuum, New Mexico*	4,800,370	4,737,657
Howard-Glasscock, Texas*	4,740,406	4,968,775
Clay City, Illinois	4,679,581	6,922,027
Anahuac, Texas†	4,667,182	2,679,491
Thompson, Texas*	4,616,615	4,338,727
Rio Bravo, California	4,530,713	2,899,087
Lafitte, Louisiana†	4,511,069	4,535,813
Dundas, Illinois	4,437,860	2,340,984
Kern River, California*	4,321,765	3,993,777
Ventura-Newhall, California*	4,284,912	2,866,015
Olla, Louisiana	4,242,495	982,363
Grayburg-Loco Hills, N. M.†	4,239,640	4,030,281
Fitts, Oklahoma†	4,223,400	6,246,313
Saxet and South, Texas*	4,212,047	5,334,338
Cayuga, Texas†	4,210,681	4,823,775
Mount Poso, California*	4,117,028	3,226,616
South Ward, Texas*	3,875,254	4,662,707
Hull-Silk, Texas	3,820,842	2,713,052
McCamey, Texas*	3,788,745	4,352,840
Earlsboro, Oklahoma*	3,757,300	3,729,866
Hoodville, Illinois	3,712,422	352,760
Van, Texas*	3,697,318	4,418,445
Total	742,106,632	757,993,998
Per cent	53.3	56.6
Total 75 largest fields of 1940		786,658,979
Per cent of U. S. total		58.8

*Over 10 years old at end of year.
†6 to 10 years old at end of year.

FIELD PRODUCTION DATA

Beginning on Page 111, production data are presented for all fields in the United States. In addition to the record of monthly output of major fields, tables have been prepared showing the production records of all fields during the past 5 years, together with the number of producing wells. These figures show the present status of every field, whether under development or on the decline. For some areas, county totals are given. Where these totals do not conform to the data on individual fields listed above them, it means that they include some production from abandoned or small fields. The latter are listed at the foot of the table.

Record Demand in 1941 Met By Increase in Completions

By W. V. HOWARD

THE number of wells completed in the United States in 1941 was 32,140 representing an increase of 2,100 over the preceding year. Of the completions, 22,005 were oil wells, 3,014 were gas wells, and 7,121 were dry holes. Each of these figures has a special significance in the light of the record of the past year, the war emergency and recent orders restricting drilling activity. Production during 1941 was 4 per cent above that of 1940. To obtain that increased production, 4½ per cent more oil wells were drilled during 1941 than during 1940. The war has greatly increased the demand for natural gas, particularly in the industrial regions east of the Mississippi. To obtain this gas over 30 per cent more gas wells were drilled in 1941 than in 1940. In order to prepare for possible increased demands, it was necessary to find more new fields. Prospecting for new fields means that a number of wildcats must be drilled of which from 85 to 90 per cent will be dry. In 1941, the number of dry holes increased by approximately 8 per cent.

Increased Depth

In order to produce this additional oil, to develop more gas reserves, and to find new fields, it was necessary to drill the average well 22 ft. deeper than in 1940. This is not a great deal, less than 1 per cent of the average depth, yet the aggregate amounted to 717,080 ft. Some districts, notably the eastern fields, produced their additional quota from shallower depths but this involved the drilling of nearly 3,000 water input wells and a corresponding number of producers in the water-flood areas of Pennsylvania, New York, and southeastern Ohio. The most noticeable increase in average depths was in coastal Louisiana where the average well drilled during 1941 was 857 ft., or approximately 12½ per cent, deeper than in 1940. Next came the Texas Gulf Coast where the average depth exceeded that of 1940 by 383 ft., or 6½ per cent.

The drilling of 1941 represents the method by means of which the oil industry has met demands made upon it for additional production and is the pattern which must be followed if it is to continue to meet those demands. With daily average production in excess of 4,000,000 bbl. it is necessary in 1942 to complete more than 22,000 wells. With increasing demands on the nation's gas reserves, it is necessary to drill more than 3,000 gas wells and if adequate insurance against future shortage is to be obtained, it will be necessary to drill more than 7,500 dry holes. Obviously, steel requirements for more than 32,500 completions cannot be met at this time, but the degree to which these requirements are not met will represent loss of efficiency in exploiting the country's oil resources. It will mean overproduction of reservoirs and corresponding increased cost of producing the oil at some later time.

Summary of Completed Wells in All the Fields of the United States in 1941 and 1940

		Comp.	Oil wells	Gas wells	Dry holes	Average footage
Eastern	1941	6,290	4,949	1,702	269	1,941
	1940	5,821	4,587	890	344	2,176
Ohio	1941	1,653	419	732	502	2,029
	1940	1,227	323	400	504	1,719
Indiana	1941	513	262	48	203	1,911
	1940	504	231	53	220	1,787
Kentucky	1941	706	233	255	218	1,683
	1940	583	234	231	128	1,032
Michigan	1941	949	440	88	421	2,105
	1940	1,104	536	50	518	1,961
Illinois	1941	3,838	2,912	13	913	2,465
	1940	3,814	3,049	15	750	2,471
Mississippi	1941	282	219	4	59	4,986
	1940	210	107	1	102	4,852
Alabama	1941	9	0	0	9	2,227
	1940	11	0	0	11	3,551
Florida	1941	1	0	0	1	1,280
	1940	5	0	0	5	3,047
Georgia	1941	1	0	0	1	1,501
	1940	2	0	0	2	2,191
Kansas	1941	2,112	1,436	79	597	3,008
	1940	1,817	1,410	65	342	3,145
Nebraska	1941	94	45	0	49	2,265
	1940	64	32	0	32	2,216
Missouri, Iowa	1941	28	1	1	26	1,147
	1940	38	0	10	28	831
Oklahoma	1941	2,110	1,235	178	697	2,621
	1940	1,834	992	165	667	2,674
North Central Texas	1941	2,835	1,727	54	1,054	2,279
	1940	2,755	1,762	37	956	2,418
Eastern Texas	1941	1,058	814	54	190	4,192
	1940	621	438	59	124	3,918
West Texas	1941	2,297	2,121	13	163	4,234
	1940	1,855	1,725	11	119	4,072
Texas Panhandle	1941	718	648	49	21	2,984
	1940	560	455	81	24	2,996
Southwest Texas	1941	1,841	1,115	88	638	4,084
	1940	2,071	1,275	70	726	4,202
Texas Gulf Coast	1941	1,078	833	36	209	6,475
	1940	1,232	977	31	224	6,092
Louisiana Gulf Coast	1941	872	616	18	238	7,757
	1940	989	741	12	236	6,902
North Louisiana	1941	792	467	93	232	2,981
	1940	668	498	27	143	2,630
Arkansas	1941	198	95	20	83	4,603
	1940	179	114	5	60	5,596
Montana	1941	283	160	71	52	2,161
	1940	234	155	41	38	2,611
Wyoming	1941	161	123	5	34	3,082
	1940	179	124	8	47	3,259
Colorado, Utah	1941	33	17	4	12	3,050
	1940	22	10	4	8	3,955
New Mexico	1941	277	209	16	52	2,721
	1940	611	479	19	113	3,269
California	1941	1,111	910	23	178	5,860
	1940	1,030	859	15	156	5,952
Total	1941	32,140	22,005	3,014	7,121	3,065
	1940	30,040	21,103	2,300	6,637	3,043
Difference		2,100	902	714	484	22
	1939	26,839	18,453	2,031	6,355	
	1938	27,149	19,121	1,985	6,043	
	1937	32,560	23,600	2,540	6,420	
	1936	25,888	18,525	2,068	5,295	
	1935	21,420	15,108	1,401	4,911	

Eastern States

Drilling increased in all areas east of the Mississippi, except in Michigan. In each of the areas involved, the causes of the change were different. In the Appalachian districts, two needs were outstanding, the requirements for lubricating oils and for gas. The waterflooding of the Bradford-Allegany area continued and a new field in Perry County, Ohio, provided additional activity for eastern operators. Gas wells increased by 812, or over 90 per cent in the eastern district and by 332, or over 80 per cent in Ohio. Because of the known proven locations, fewer dry holes were drilled in each area, although there were a number of deep tests in northeastern Ohio which sought new reserves, particularly in the Oriskany sand. Practically all of these were failures. The most notable additions to gas reserves were in West Virginia in the Ripley and Ravenswood areas where large Oriskany pools were tapped.

In Indiana, there was a great increase in wildcatting with the result that a number of small fields were opened. These were not sufficient to maintain the state's reserves at the present rate of production, although they represented nearly 2 years' production at the preboom rate. The number of dry holes drilled in 1941 was nearly equal to the total number of wells drilled in 1940. In Illinois, there was a decline of 137 in oil wells completed and an increase of 163 dry holes. This indicates the intensity with which the search for new fields was carried on and also the necessity of maintaining drilling in order to keep production up for with a decline of 4½ per cent

in oil-well completions, there was a decline of approximately 15 per cent in production, despite the productivity of the newly developed Johnsonville, Benton, and Woodlawn fields.

Michigan's decline in activity mirrors the drop in encouragement for that activity during the first half year. Until Reed City, Winterfield, and Headquarters showed that possibilities for new production were by no means exhausted, Michigan was in the doldrums.

Northern Mid-Continent

Completions in Kansas increased during 1941 by 295 and dry holes increased by 255 or more than 80 per cent of the increase. Kansas production was stepped up by more liberal allowables and more oil can be produced by the same means. During 1941 the linking of many pools showed that much of the area between producing fields along the Barton arch is potentially productive. Under normal conditions, 1942 would see much drilling in these areas and a corresponding increase in proven reserves. New areas were opened up in the Anadarko or Dodge City basin, particularly in Barber County and also on the southwest flank of the Barton arch. These areas await development in the coming year.

The Forest City basin play has narrowed down to a small area in southwestern Nebraska which saw more activity in 1941 than in 1940. Despite some discoveries in this area, it appears that drilling will be less next year than in 1941.

In Oklahoma a number of discoveries were made of which the majority were disappointing if compared with the good old days of Seminole. Most of the discoveries developed into small fields which were rapidly drilled up and showed signs of declining equally rapidly. The one outstanding discovery was Apache which not only developed notable reserves but threw open at least the eastern flank of the Anadarko basin for further development. More, possibly, than any other state west of the Mississippi, Oklahoma requires intensive development of any new fields and much drilling of old areas where there are important reserves of oil at shallow depth. Under normal conditions these reserves, both in the northeastern and southern sectors, would undergo intensive development in 1942.

Arkansas, North Louisiana, and Mississippi

The Wilcox trend in North Louisiana came in for intensive development following the discovery of Olla and Nebo in 1940. Production has been obtained from the Wilcox almost to the Mississippi River and the lease play has extended into Mississippi. More development of this area can be expected during the coming year but for the time being, Arkansas may have stolen the spotlight by renewed activity in the Smackover lime producing area. The industrial development of this region has provided additional markets for the gas and with large-scale scrubbing plants to remove the sulfur more drilling may be expected here. Of even greater importance is the area north of the supposed limit of Smackover production where the first major discovery of 1942 has been made. The Midway pool is already experiencing much activity and this may be expected to spread into northeastern Texas.

East Texas and the Gulf Coast

East Texas had a great increase in activity due to two main causes, the development of Hawkins and a resurrection of drilling in the East Texas field following the granting of a number of exceptions to Rule 37. Hawkins gave rise to much wildcatting, with little success, whose extent may be noted by an increase of 66, or more than 50 per cent in the number of dry holes drilled in the area. Along the Gulf Coast, there was a general letting down of drilling. This was in part due to the increasing depth of the wells and increased cost and in part to the fact that many of the new areas were under unit control and did not need to be drilled up so rapidly. Reserve figures show that this section has a substantial backlog and does not require additional drilling to the same extent as other parts of the country. This is less true of Southwest Texas than of the other sections and this area would probably see an increase in activity under normal conditions.

Permian Basin and Panhandle

There was a decided decline in drilling in New Mexico in 1941 due to the fact that there was little undrilled probable territory left to drill. The best possibilities for an increase in drilling appear to lie in a westward extension of the play now under way in the northern basin of West Texas. Drilling increased approximately 25 per cent in West Texas due to this campaign, added to development of deep pays in the southern sector. Large producing areas have been blocked out on both sides of the Pecos River and it is expected that these will continue to be drilled during the year. In the north, Slaughter has still to be drilled up and there are two deeper pays at Wasson which will see more drilling if conditions warrant. In addition, a number of discoveries have been made to the northeast of these fields and some of these may open up areas of major importance. It is expected that this section of the country will be less affected by restrictions on drilling than any other because operators are already used to 40-acre spacing and can proceed on this basis with a minimum of difficulty.

A small increase in price and a decline in Oklahoma production caused an increase in drilling in the Panhandle. This is probably the largest area of proven and undrilled reserves in the country as is shown by the ratio of 697 oil or gas wells and 21 dry holes.

North Central Texas

This section saw more discoveries in 1941 than any other except, possibly, Illinois. Most of these discoveries have little possibility of developing into major fields but the potentialities of deeper pays became more apparent during the past year than ever before. The Ellenburger pay in Wichita, Archer, and Wilbarger counties alone could accommodate more than 1,000 wells. Under normal conditions, this area would probably see more than 3,000 wells in 1942. Whether or not they will be drilled depends on influences entirely outside the industry.

Rocky Mountain Area and California

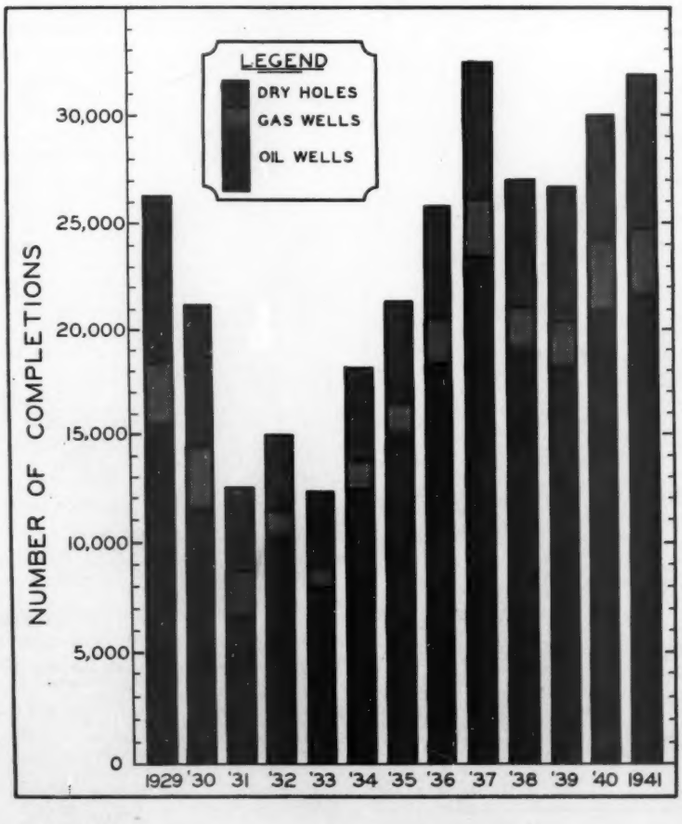
Gas developments in the Rocky Mountain area, particularly in Montana increased greatly in 1941. With expanding markets, this should continue through 1942. There have been no notable discoveries to warrant much increase in drilling for oil.

Last year it was predicted that drilling in California would be less than in 1940. Instead, it was some 8 per cent greater. According to present indications, the same prediction can be made with regard to 1942, possibly with the same results. Next year's drilling will probably be largely confined to wildcatting in the coastal and northern San Joaquin Valley sectors with some development of discoveries already made in the latter area. High hopes are held out for the possibility of production from the Cretaceous but transportation difficulties imposed by the war combined with a shutting off of exports will probably cause a diminution of activity in California next year.

Considering only the increased demand and the necessity of developing additional reserves to meet it, it is normal to expect an increase in drilling activity next year. The status of the nation's reserves, transportation facilities, markets, and undeveloped proven acreage would localize this drilling in the interior from West Texas to Pennsylvania and Montana. The most active sector along the coastal areas would probably be South Texas because of the known possibilities of additional production there.

It is impossible to appraise the possible effects of factors outside of the industry upon the program envisaged by this analysis. It is entirely probable that drilling will be curtailed. Some observers consider that this curtailment will run between 25 and 50 per cent, or even more. If this is the case, the industry will be storing its energies for a sharply accentuated campaign in the future. The history of the oil industry plainly shows the necessity for this drilling.

WELL COMPLETIONS OVER A 13-YEAR PERIOD SHOWING NUMBER OF OIL WELLS, GAS WELLS AND DRY HOLES RECORDED



PROVEN RESERVES

(Continued from Page 61)

(Numbers on map correspond to those in tables)

CALIFORNIA

Field and county; producing formation—	Discoveries Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (bbl.)
(1) Oak Canyon, Los Angeles, Modelo, Miocene	120	15-146	2,500,000
(2) Raisin City, Fresno, Temblor, Miocene	200	6-40	5,000,000
(3) Union Avenue, Kern, Chanac, Pliocene	120	55	1,250,000
Santa Margarita, Miocene		40	
(4) Riverdale, Fresno, Temblor, Miocene	80	20	2,000,000
Miscellaneous*			1,380,000
*(5) Dyer Creek; (6) Helm; (7) Jacalitos; (8) Panoche (9) Shafter; (10) Turnbull Canyon.			
Total			12,130,000
Extensions			
(11) Dominguez, Los Angeles, Callender, Miocene	160	75	10,000,000
(12) Greeley, Kern, Rio Bravo and Vedder, Miocene	300	150	20,000,000
(13) Huntington Beach, Orange, various, Pliocene-Miocene	360	250	15,000,000
(14) Inglewood, Los Angeles, Sentous, Miocene	300	250	25,000,000
(15) Paloma, Kern, Stevens, Miocene	1,000	150	10,000,000
(16) Rincon, Ventura, Hobson, Pliocene	320	100-1,000	5,000,000
(17) Rio Bravo, Kern, Rio Bravo and Vedder, Miocene	380	150	10,000,000
(18) Tupman, Kern, Stevens, Miocene	240	50-250	15,000,000
Miscellaneous*			750,000
*(19) Elk Hills; (20) McKittrick.			
Total			115,750,000

COLORADO

Extension

(1) Wilson Creek, Rio Blanco, Sundance-Morrison	620	...	9,000,000

MONTANA

Discovery

(1) West Kevin, Toole, Ellis-Madison	170	...	360,000

Extension

(2) Cut Bank, Glacier, Sunburst-Cut Bank	320	...	1,280,000

WYOMING

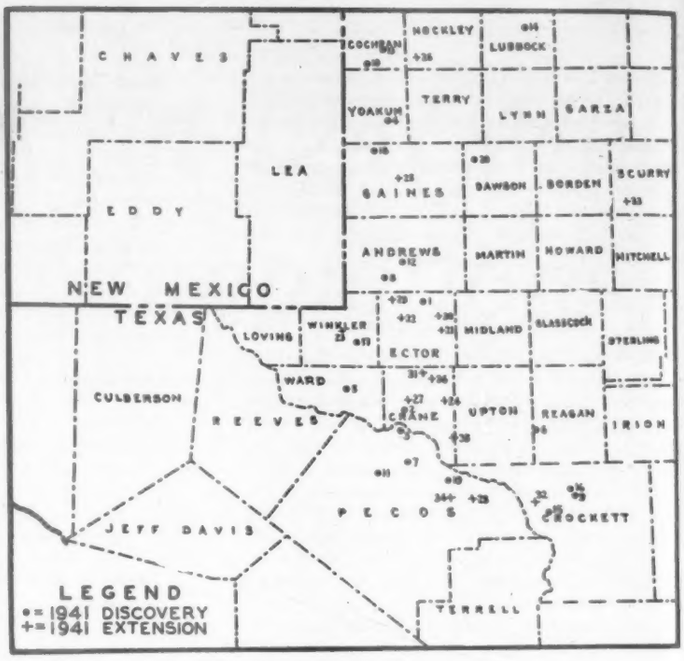
Extensions

(1) Cole Creek, Natrona, Shannon	280	...	2,800,000
(2) Wertz, Carbon-Sweetwater, Tensleep	200	...	5,000,000
Miscellaneous*			2,120,000
*(3) Circle Ridge; (4) East Mahoney; (5) Lost Soldier; (6) Mahoney; (7) Maverick Springs.			
Total			9,920,000

INDIANA

Discoveries

(1) Mount Vernon, Posey, Cypress, Waltersburg	200	24-37	1,500,000
(2) South Bufkin, Posey, Cypress	240	12	960,000
Miscellaneous*			690,000
*(3) Elkhart; (4) Vernon; (5) Columbia; (6) Stendal; (7) Howell; (8) Patoka; (9) Stewartville; (10) Yankeetown; (11) Carlisle; (12) Hazleton.			
Total			3,150,000



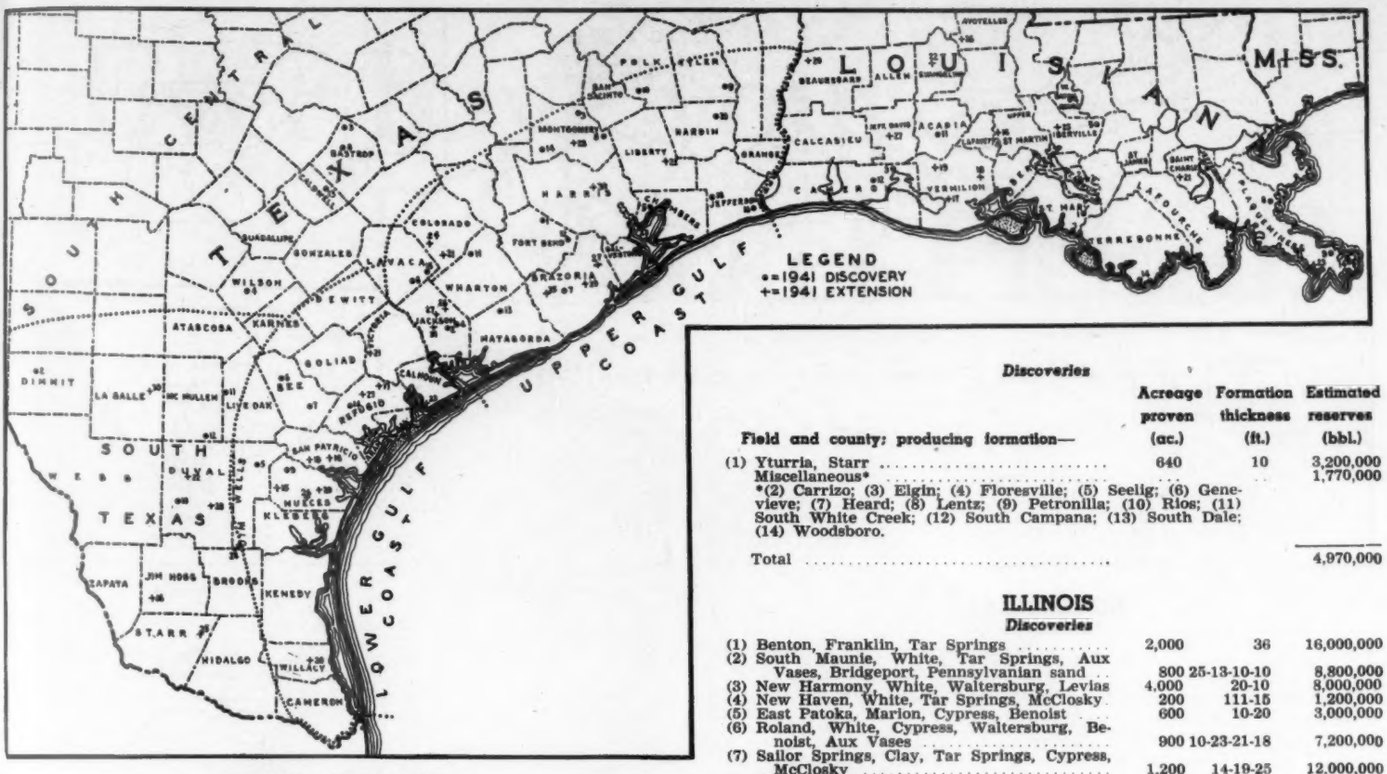
PERMIAN BASIN

Field and county; producing formation—	Discoveries Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (bbl.)
(1) North Cowden, Ector, Double Mountain	300	30	1,500,000
(2) Sand Hills So. Ext., Crane — Ellen. (Ord.)	500	23	3,700,000
(2) Sand Hills So. Ext., Crane — Simp. (Ord.)	40	145	
(3) Abell, Pecos — Ellenburger (Ord.)	40	20	4,270,000
(3) Abell, Pecos — Simpson (Ord.)	240	15	
(3) Abell, Pecos — Tubb (Perm.)	300	90	
(3) Abell, Pecos — Clear Fork (Perm.)	40	85	
(4) Ownby, Yoakum, San Andres	160	22	1,040,000
(5) Spencer, Ward, Permian lime	200	55	1,100,000
(6) Barnhart, Reagan, Ellen. (Ord.)	160	70	2,400,000
(7) South Apco, Pecos, Ellen. (Ord.)	100	25	1,000,000
Miscellaneous*			3,320,000
*(8) West Andrews; (9) Bean; (10) Rhodes; (11) Heiner; (12) West Fuhrman; (13) O'Neal-Wright; (14) Lubbock; (15) Clara Couch; (16) Todd Deep; (17) Weiner; (18) Wasson Deep; (19) Wentz; (20) Albaugh Handley.			
Total			18,330,000
Extensions			
(3) Abell, Pecos, Simpson (Ord.)	2,500	30	25,000,000
(21) Foster, Ector, Big lime	560	35	3,920,000
(22) Goldsmith, Ector, Big lime	640	70	7,040,000
(23) Keystone Colby, Winkler, Yates sand	450	30	2,250,000
(24) McElroy, Crane-Upton, Big Lake lime	2,300	75	27,600,000
(25) Seminole, Gaines, Big lime	4,500	60	31,500,000
(26) Slaughter, Hockley-Cochran-Terry, San Andres	8,000	90	60,000,000
(27) Sand Hills Permian, Crane, Big lime	800	52	7,000,000
(16) Todd Deep, Crockett, Strawn	600	80	6,000,000
(18) Wasson, Gaines-Yoakum, San Andres	3,700	90	29,600,000
(28) Walker, Pecos, Big lime	660	25	3,300,000
(1) North Cowden, Ector, Big lime	500	56	5,000,000
Miscellaneous*			7,980,000
*(29) North Goldsmith; (30) Johnson; (31) Jordan; (32) Noelke; (33) Sharon Ridge; (34) Taylor-Link; (35) McCamey; (36) Waddell.			
Total			216,190,000

KANSAS

Discoveries

Miscellaneous, Arbuckle*	1,040	...	5,200,000
*(1) Seward; (2) Bowman; (3) Sugarloaf; (4) West Kraft; (5) Shaeffer; (6) Northwest Ainsworth; (7) Stafford; (8) Rusch; (9) Ahnert; (10) Northwest Greenvale; (11) Stickney; (12) Forest Hill; (13) Gustason; (14) West Ainsworth; (15) Youngmeyer; (16) Bruce; (17) East Pawnee Rock; (18) Kowalsky; (19) East Kraft-Prusa; (20) Ogallah.			
(21) Geneseo, Rice, Simpson	40	6	160,000
(22) Lake City, Barber, Simpson	40	6	160,000
(23) Rick, Barton, Lansing-Kansas City	160	18	800,000
Miscellaneous, Lansing-Kansas City*	800	...	3,200,000
*(24) High Spot; (25) Penokee; (5) Shaeffer; (26) Dayton; (27) Straub; (28) Dubuque; (29) Macksville; (30) Hewitt; (31) Dayton; (32) Erway; (33) Dreiling; (34) Gettysburg; (35) Sec. 21-28-11e; (36) Sun City; (37) Eberhardt.			
(38) Peace Creek, Reno, Viola	480	11	3,360,000
Miscellaneous, Viola*	120	...	840,000
*(39) Friendship; (40) Hendrickson; (41) Northeast Peace Creek			
Miscellaneous,* other pays	...	...	1,580,000
*(42) Gibson; (43) Deichman; (44) East Frog Hollow; (45) Keighley; (46) Patterson; (47) East Welch; (48) West Bornholdt; (49) Mohl; (50) Hall-Gurney; (51) East Ray.			
Total			15,300,000
Extensions			
(50) Hall-Gurney, Russell, Lansing, Gorham, and Arbuckle	1,600	...	16,000,000
(52) Zenith, Stafford, Viola and Misener	1,000	...	7,000,000
(53) Kraft-Prusa, Barton, Arbuckle	1,240	...	4,960,000
(54) Trapp, Barton, Arbuckle	1,220	...	4,880,000
(55) Greenvale, Russell, Lansing and Gorham	800	...	4,000,000
(56) Big Creek, Russell, Gorham	720	...	3,600,000
(57) Bemis, Ellis, Arbuckle	960	...	3,840,000
(58) Ray, Phillips, Lamotte	600	...	1,800,000
Others	...	...	39,000,000
Total			85,080,000



TEXAS GULF COAST

Discoveries

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (bbl.)
(1) Clodine, Fort Bend	240	10	1,200,000
(2) North La Ward, Jackson	1,500	10	7,500,000
(3) Lake Creek, Montgomery	700	10	3,500,000
(4) Maurbro, Jackson	2,500	10	17,500,000
(5) Oyster Bayou, Chambers	160	30	2,400,000
Miscellaneous*			2,135,000
*(6) Brushy Creek; (7) Chenango; (8) Fostoria; (9) Fred; (10) Goodrich; (11) Lissie; (12) Needville; (13) Lucky; (14) Magnolia; (15) Provident City; (16) Sabine Pass; (18) Stowell; (19) West Silsbee.			
Total			34,235,000

Extensions

(20) Ganado, Jackson	220	10	1,650,000
(21) Garwood, Colorado	150	10	1,250,000
(22) Hull, Liberty	100	10	1,500,000
(23) Red Fish Reef, Chambers	340	10	3,400,000
(24) Sheridan, Colorado	160	10	4,000,000
(25) West Columbia, Brazoria	80	25	1,600,000
(26) West Ganado, Jackson	500	10	10,000,000
Miscellaneous*			1,150,000
*(27) Chocolate Bayou; (28) Conroe and West; (29) Danbury; (30) Dyersdale; (31) Texana.			
Total			24,550,000

LOUISIANA GULF COAST

Discoveries

(1) Bayou Sale, St. Mary	1,200	10	12,000,000
(2) Lake Chicot, St. Martin	640	20	6,400,000
(3) Lakeside, Cameron	640	15	1,000,000
(4) Port Allen, West Baton Rouge	200	10	1,500,000
(5) St. Gabriel, Iberville	400	40	8,000,000
Miscellaneous*			21,390,000
*(6) Bastian Bay; (7) Belle Isle; (8) Delacroix Island; (9) Delta Duck Club; (10) Lapeyrouse; (11) Lewisburg; (12) Pecan Lake; (13) Point au Fer; (14) Unknown Pass; (15) Westwego.			
Total			50,290,000

Extensions

(16) Anse La Butte, St. Martin	150	40	4,000,000
(17) East White Lake, Vermilion	160	10	2,500,000
(18) Erath, Vermilion	1,960	10	2,000,000
(19) Gueydan, Vermilion	370	20	4,200,000
(20) Neale, Beauregard	640	20	9,800,000
(21) Paradis, St. Charles	1,500	30	30,000,000
(22) Pine Prairie, Evangeline	100	25	3,000,000
(23) West Bay, Plaquemines	360	20	3,600,000
(24) West Lake Verret, St. Martin	200	10	2,500,000
Miscellaneous*			700,000
*(25) Bayou Blue; (26) Eula; (27) Welsh.			
Total			63,200,000

SOUTHWEST TEXAS

Extensions

(15) Agua Dulce, Nueces	3,000	20	46,000,000
(16) Colorado, Jim Hogg	1,200	10	7,500,000
(17) Fagan, Refugio	300	10	2,000,000
(18) Midway, San Patricio	640	10	6,400,000
(19) Odem, San Patricio	100	10	1,000,000
(20) Willamar, Willacy	960	20	4,000,000
Miscellaneous*			2,350,000
*(21) Cologne; (22) Government Wells; (23) Jay Welder; (24) La Gloria; (25) La Reforma; (26) Luby; (27) Refugio; (28) Sweden; (29) Chapman Ranch; (30) Washburn.			
Total			69,250,000

Discoveries

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (bbl.)
(1) Yturria, Starr	640	10	3,200,000
Miscellaneous*			1,770,000
*(2) Carrizo; (3) Elgin; (4) Floresville; (5) Seelig; (6) Genevieve; (7) Heard; (8) Lentz; (9) Petronilla; (10) Rios; (11) South White Creek; (12) South Campana; (13) South Dale; (14) Woodsboro.			
Total			4,970,000

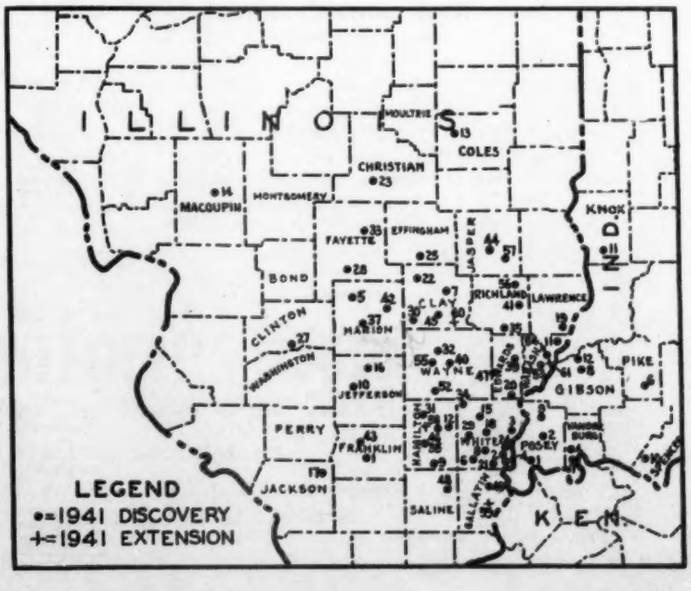
ILLINOIS

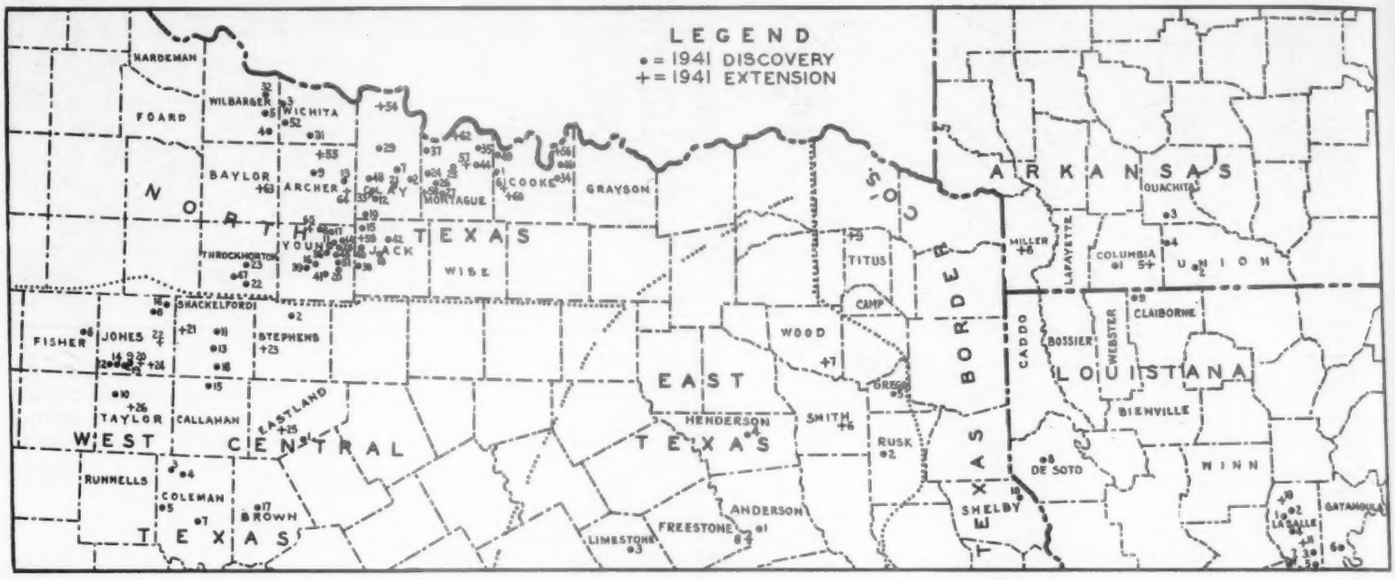
Discoveries

(1) Benton, Franklin, Tar Springs	2,000	36	16,000,000
(2) South Maunie, White, Tar Springs, Aux Vases, Bridgeport, Pennsylvanian sand	800	25-13-10-10	8,800,000
(3) New Harmony, White, Waltersburg, Levias	4,000	20-10	8,000,000
(4) New Haven, White, Tar Springs, McClosky	200	111-15	1,200,000
(5) East Patoka, Marion, Cypress, Benoist	600	10-20	3,000,000
(6) Roland, White, Cypress, Waltersburg, Benoist, Aux Vases	900	10-23-21-18	7,200,000
(7) Sailor Springs, Clay, Tar Springs, Cypress, McClosky	1,200	14-19-25	12,000,000
(8) Storms, White, Cypress	1,000	21	4,000,000
(9) Walpole, Hamilton, Aux Vases	600	40	3,000,000
(10) Woodlawn, Jefferson, Benoist	2,500	19	12,500,000
Miscellaneous* Chester			3,195,000
*(11) Allendale; (12) Bungay; (13) Cook's Mill; (14) North Carlinville; (15) East Centerville; (16) South Dix; (17) Elkville; (18) Epworth; (19) East St. Francisville; (20) West Grayville; (21) South Herald; (22) Iola; (23) Lakewood; (24) Maunie; (25) Mason; (26) South New Harmony; (27) Posey; (28) St. Paul; (29) Stokes; (30) Xenia.			
(31) Dahlgren, Hamilton, McClosky	500	22	3,000,000
(32) Johnsonville, Wayne, McClosky, Levias, Aux Vases	6,000	80-15-20	36,000,000
(33) Louden, Fayette, Devonian	1,000	60	5,000,000
(34) Mill Shoals, White, McClosky	900	6	3,600,000
(35) Parkersburg, Richland, McClosky	600	18	3,600,000
(36) Rural Hill, Hamilton, McClosky, Levias, Aux Vases	1,500	19-6-17	12,000,000
(37) Salem, Marion, Trenton	2,000	23	4,000,000
Miscellaneous,* McClosky, Levias, etc.			6,840,000
*(39) Bone Gap; (40) Boyleston and East; (41) Bonpas and West; (42) Alma; (43) North Benton; (44) North Boos; (45) West Clay City; (46) Dale; (47) Ellery; (48) Eldorado; (49) North Inman; (50) Jeff; (51) North Maunie; (52) Mayberry; (53) Maud; (54) Patton; (55) Simms; (56) Stringtown; (57) Ste. Marie.			
Total			178,690,000

Extensions

(46) Dale, Hamilton	1,000	..	5,000,000
(58) Hoodville, Hamilton	900	..	4,500,000
(3) New Harmony, White	2,500	..	12,500,000
(59) Inman, Gallatin	400	..	2,000,000
(44) North Boos, Jasper	700	..	2,800,000
(60) Clay City, Clay	1,000	..	5,000,000
(61) Mount Carmel, Wabash	2,500	..	12,500,000
Total			44,300,000





NORTH TEXAS

Discoveries

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (bbl.)
Miscellaneous*, Ellenburger			1,540,000
*(1) Bindel; (2) Worsham; (3) Electra; (4) Consolidated; (5) Rock Crossing.			
(7) New York City, Clay, Mississippian	200	85	1,600,000
(8) Burns-Larrimore, Young, Mississippian	200	30	1,200,000
Miscellaneous*, Mississippian			1,380,000
*(9) Taylor; (10) Antelope; (11) Williamson; (12) Wynn; (13) Scotland; (14) Anzac-Graham; (15) Maxey.			
Miscellaneous*, Caddo (Bend)			1,730,000
*(16) Newcastle; (11) Williamson; (17) Burns Ragland; (18) Hoefle; (19) Kerlyn-McClure; (20) Logan; (21) Bridwell-Mayers; (22) Parrott; (23) McKnight.			
(16) Newcastle, Young, Marble Falls (Bend)			660,000
Miscellaneous*, conglomerate (Bend)			1,380,000
*(24) Benson; (25) Clingensmith; (26) Stoneburg.			
Miscellaneous*, Bend			990,000
*(27) Turner; (28) Taylor; (29) Spring; (30) Cartwright; (31) K.M.A.			
Miscellaneous*, Strawn			2,250,000
*(32) Harrold; (33) Burns-Browning; (34) Wilson; (35) Hott; (36) Allen; (37) Chapman-McFarlin; (38) Jermyn; (39) Vaughn; (40) Mathis; (41) Gilmore; (42) Elmore-Meyers; (43) Rankin-Stewart; (44) Thomas; (45) Kerlyn-Loving; (46) Osburn; (1) Bindel.			
Miscellaneous*, Cisco			1,020,000
*(47) Hously-McCord; (48) Patrick; (49) Golden; (50) Story-Wilson; (51) Willard; (52) Sisk; (53) Parsons; (31) K.M.A.			
Total			13,750,000
Extensions			
(31) K.M.A.-Ellenburger, Wichita, Ellenburger (Ord.)	3,900	30	26,600,000
(54) Fargo, Wilbarger, Strawn (3 pays)	500	25	3,000,000
(55) Hull-Silk, Archer, Strawn and Bend	800	45	5,600,000
(56) Walnut-Bend, Cook, Strawn	200	30	1,500,000
(10) Antelope, Clay, Strawn	200	40	1,200,000
(57) Bonita, Montague, conglomerate (Bend)	300	24	2,400,000
Miscellaneous*			5,180,000
*(58) Hults-Owens; (59) Mathis; (60) T.C.U.; (61) Voth; (62) Nocona; (63) Rendham; (64) Kadane; (65) Olney.			
Total			45,480,000

WEST CENTRAL TEXAS

Discoveries

Miscellaneous* Bend			160,000
*(1) Kirk; (2) Eliasville.			
(3) Silver Valley, Coleman, Gray sand (Strawn)	400	35	2,400,000
Miscellaneous* Strawn			630,000
*(4) Jim Ned; (5) Talpa.			
(6) McCaulley, Fisher Canyon	260	28	1,300,000
Miscellaneous* Canyon			170,000
*(7) Overall; (8) West Avoca.			
(9) Wimberly, Jones, Cisco (3 pays)	160	15	1,200,000
(10) Merkel, Taylor, Cisco (2 pays)	160	10	1,040,000
Miscellaneous* Cisco			2,690,000
*(11) Cook; (12) East Noodle Creek; (13) Elliott; (14) Stith; (15) Diller; (16) Spurrier; (17) West Brownwood; (18) Dyer; (19) East Wimberly.			
Total			9,590,000
Extensions			
Miscellaneous*			1,975,000
*(20) Akard; (21) Bluff Creek; (22) Lewis-Steffens; (23) Loving; (24) Sayles; (25) South Carbon; (26) View.			

ARKANSAS

Discoveries

(1) Macedonia, Columbia, Smackover	1,280	12	12,000,000
Miscellaneous*			1,800,000
*(2) East Schuler; (3) Holly; (4) Mount Holly.			
Total			13,800,000
Extensions			
(5) Atlanta, Columbia, Smackover	120	25	840,000
(6) Fouke, Miller, Paluxy	160	15	960,000
(7) McKamie, Lafayette, Smackover	840	100	15,480,000
Total			17,280,000

NORTH LOUISIANA

Discoveries

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (bbl.)
(1) Little Creek, La Salle, Wilcox	2,900	16	14,500,000
(2) South Olla, La Salle, Wilcox	1,800	6	10,000,000
Miscellaneous* Wilcox			1,260,000
*(3) Cypress Bayou; (4) Trout Creek; (5) Larto Lake; (6) Willow Lake; (7) Holloway.			
Miscellaneous,* other pays			580,000
*(8) Stack; (9) Haynesville.			
Total			16,340,000
Extensions			
(10) Olla, La Salle, Wilcox	3,200	15	16,000,000
(11) Nebo, La Salle, Wilcox	3,800	10	19,000,000
Total			35,000,000

OKLAHOMA

Discoveries

(1) Guthrie, Logan, Wilcox	440	20	4,400,000
(2) Tecumseh Lake, Pottawatomie, Wilcox	420	11	4,200,000
(3) West Hotulke, Pottawatomie, Wilcox	1,280	21	5,400,000
(4) East St. Louis, Pottawatomie, Simpson dolo.	240	9	1,200,000
(5) Cumberland, Marshall-Bryan, McLish	840	40	8,400,000
(6) Apache, Caddo, Simpson	500	205	15,000,000
Miscellaneous* Simpson and Wilcox			3,720,000
*(7) East Pawnee; (8) North Little River; (9) West Maud; (10) West Bethel; (11) Noble; (12) East Tecumseh; (13) Velma; (14) Northeast Wewoka; (15) Otoe City; (16) Northeast Mehan; (17) Sylvian.			
(18) North St. Louis, Pottawatomie, Hunton	420	42	1,680,000
(19) Hotulke, Pottawatomie, Hunton	1,280	30	3,840,000
(3) West Hotulke, Pottawatomie { Hunton / Viola	1,280 / 960	40 / 45	5,760,000
(20) East Tecumseh, Pottawatomie, Viola	640	38	2,560,000
Miscellaneous* Viola, Hunton, and Misener			1,600,000
*(21) West Okemah; (22) Castle; (23) East Orlando; (24) South Dill; (25) Navina; (26) East Wetumka; (27) South Castle; (28) West Peck.			
(29) East Stroud, Creek, Prue	640	42	3,840,000
(30) Rusk (Walnut Bend), Okfuskee	360	19	1,440,000
(31) North Davenport	240	26	960,000
(32) West Loco, Stephens, Pennsylvanian sand	320	38	960,000
Miscellaneous* Pennsylvanian			3,590,000
*(33) North Okemah; (1) Guthrie; (34) West Fish; (35) West Arno; (36) Mason; (37) East Okemah; (38) North Castle; (39) Sinclair; (40) Harper.			
Total			68,550,000
Extensions			
(42) East Cromwell, Okfuskee, Cromwell	640	32	3,200,000
Miscellaneous*			1,900,000
*(44) Depew; (45) Fish.			
Total			5,100,000

MICHIGAN

Discoveries

(1) Headquarters, Roscommon, Traverse-Dundee	600	60	3,600,000
(2) Winterfield, Clare, Traverse-Monroe	800	60	4,800,000
(3) Adams, Arenac, Monroe	800	30	4,000,000
(4) Reed City, Osceola, Traverse and Monroe	3,000	60	18,000,000
Miscellaneous*			1,200,000
*(5) Blue Lake; (6) Muskrat Lake; (7) Trowbridge; (8) Otisville; (9) West Hopkins; (10) Lee; (11) Akron; (12) Farwell.			
Total			31,600,000

NEBRASKA

Discoveries

Miscellaneous* Hunton			500,000
*(1) Barada; (2) Falls City, deep.			

MISSISSIPPI

Discoveries

Miscellaneous*			1,060,000
*(1) Tinsley, Deep; (2) Cary; (3) Pickens-Sharpsburg.			
Extension			
(1) Tinsley	4,700	45	47,000,000

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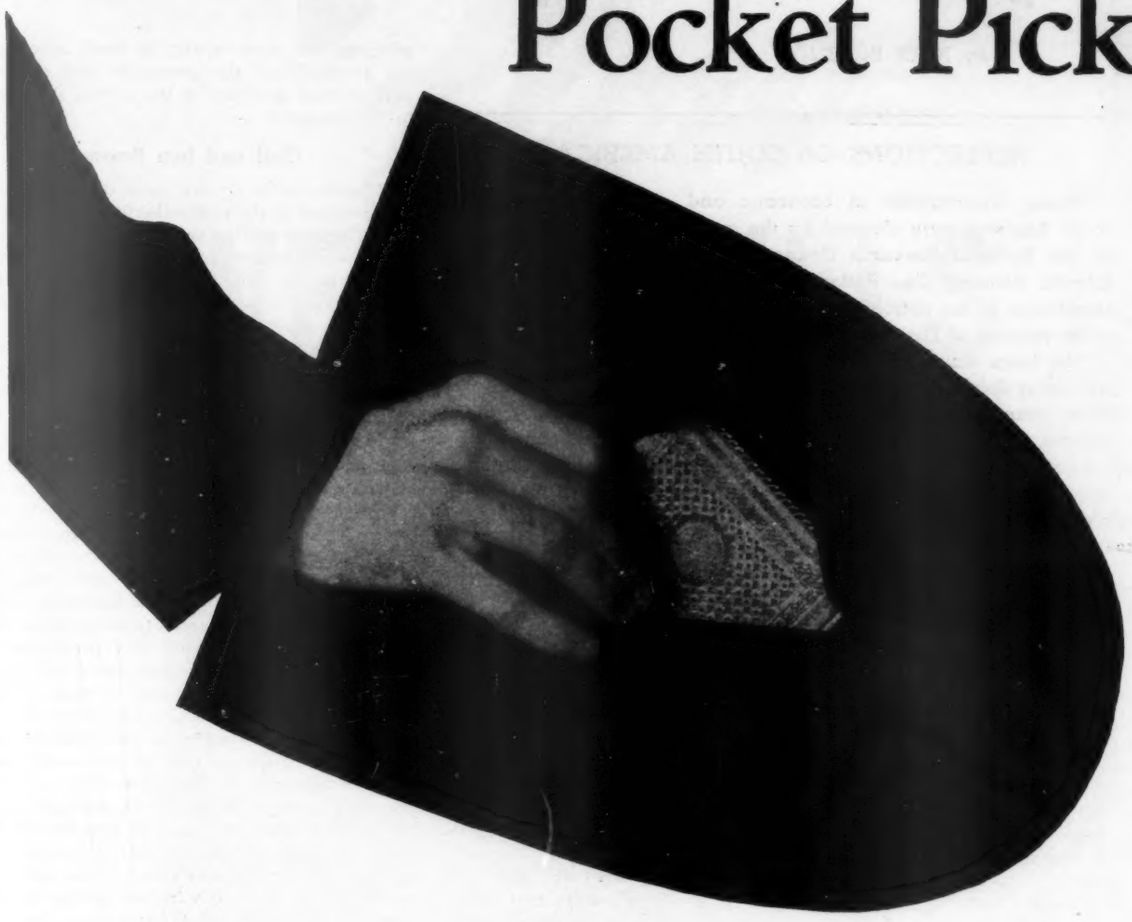

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South American Countries Need Industry to Develop Resources

By JOHN D. GILL
Atlantic Refining Co.

JOHN D. GILL

REFLECTIONS ON SOUTH AMERICA

These observations of economic and social conditions in South America were gleaned by the author on a tour sponsored by the National Research Council. Mr. Gill, a director of the Atlantic Refining Co., Philadelphia, is one of the outstanding economists in the petroleum industry and prepared this analysis at the request of The Oil and Gas Journal.

The large stake of American and British oil companies in the producing fields of South America, along with the importance of those countries in supplying the petroleum required by the Allied nations' war program, makes this review of basic conditions significant.

Mr. Gill's rise with Atlantic to a board position was largely through the refining branch. He was first engaged in lubricating-oil research, became director of the control laboratory, superintendent of one of the refineries and now devotes most of his time to economic questions.

IN the modern world large endowments of natural resources are not enough to provide achievement of a high standard of living. Nor is man's brawn, working through simple tools, sufficient competitively to wrest raw materials from nature and to shape from them objects desired by mankind. Nature in some of its many aspects is, of course, all-essential to the supplying of civilized man's wants; but these wants will not be satisfied except as the brain power of man operates at a competitive level to accelerate and improve upon natural processes.

This is a conclusion which a student of South America's economy reaches after reflection upon many relevant facts. Curiously, it is a conclusion which, in principle, might be applied to modern warfare wherein it is plainly seen that manpower, inadequately supported by science and technology, those vital products of man's brain, falls in the conflict. Except for those rare products of nature like the unparalleled precious stones of the Orient or the pelts of the chinchilla of South America (and even these require some processing), the trend through the ages, and particularly since the beginning of the industrial era, and now more especially during the chemico-industrial era, has been away from the use of an unfabricated product of nature like an animal's skin to, say, a highly synthesized product like nylon, a good example of a man-conceived and created textile fiber. Clearly, the trend is toward synthetics and highly processed raw materials.

Slow Improvement Likely

Perhaps it is because of the rapid tempo with which the processes just mentioned are developing in the world's most highly industrialized countries that it will be difficult even over a long period for South Americans as a whole to raise the level of their material welfare to that of the economically highly organized countries despite the possession by South America of large measures of many of the materials which preceding generations have found so necessary to the attainment of their present-day standard of living. Nor do we have to depend solely upon South American illustrations for a better understanding of the principle involved. It operates in the United States as elsewhere. The average per capita dollar income of our own farm population, engaged in raising both foodstuffs and industrial raw materials, is less than half (about 45 per cent) that of the remainder of our population, and this despite the fact that our agricultural population accounts for more than 70 per cent of the aggregate production of primary commodities in the United States.

South American brawn, working upon and abetted by nature, produces results that would justify a very high ranking of the South American economy if the primary production of foodstuffs and raw materials alone was a suitable criterion. This statement can be made comprehensive enough for the present purpose by resort to a few figures. The value of the world's total production of primary commodities is divided approximately into 65 per cent for crude foodstuffs and 35 per cent for other raw materials. Of the crude foodstuffs, cereals represent nearly 40 per cent and meats almost 37 per cent. Now, note that in recent years, South America, with only 4.3 per cent of the world's population, has produced about 6.7 per cent of the world's output of wheat and 14.7 per cent of the world's output of maize, that is, 1½ and 3.4 times, respectively, its per capita share of these great cereal crops.

Meat, which is so important among the world's crude foodstuffs, is produced in South America to the extent of more than 13 per cent of the world's total production or about three times South America's per capita share. Looked at in another way, the meat production of South America alone equals approximately 3¼ per cent of the world's total production of all kinds of primary commodities. That is, this one product represents 75 per cent of the total production required of the South American continent if it were to produce just its proportionate population share of the world's total production of all primary commodities, namely, 4.3 per cent. An integration of fruits and vegetables, growing in importance here as an element of diet and likewise growing with great rapidity in South America, is not available but the production and consumption of these products of the garden are known to be extensive.

Coal and Iron Scarce

Stress should not be laid upon the South American position in the production of such things as wines, coffees and cocoa because each of these groups of foodstuffs represents a very small proportion of the total consumption of mankind. Nevertheless, in passing, it should be noted that the South American production of wines is approximately 50 per cent more than the per capita world average; that South America supplies 13.8 per cent of the world's cane sugar; 26.5 per cent of the world's cocoa; and 73.2 per cent of the world's coffee.

In the field of production of primary nonfood materials, the South American countries, in the aggregate, again acquit themselves in virtually all important subdivisions of this category except, and this is significant, in the subdivisions of coal and iron production. The most important subdivision of the nonfood raw materials, which as pointed out above represents about 35 per cent of the total primary commodity production, is the fuel group which accounts for about 10 per cent of all kinds of production or about 30 per cent of raw materials other than food. In coal production South America is very laggard, producing less than 1 per cent of the world's total or much less than its per capita share. Its coal has been supplied largely from Europe, transportation of which has been so impeded by the war as actually to force a relatively progressive country like Argentina to resort to the extensive use of corn as fuel under boilers during the past year or more. On the other hand, South America, in the aggregate, currently is producing more than 13 per cent of the world's total of crude petroleum and its use of timber as fuel is known to be very extensive.

Textile Production High

In the world's requirements for items in the nonfood group, the textile fibers run a close second to the fuel group. Among the textile raw materials, wool and cotton rank highest and in these South America produces much more than her per capita share—1.5 per cent of the world's total output of wool or 3.6 times her share and 10.5 per cent of the world's production of cotton or 2½ times her per capita share. Moreover, South America produces 11.3 per cent of the world's cottonseed; 46.6 per cent of the world's flaxseed; 19.3 per cent of the world's copper; 31.1 per cent of its antimony; virtually 100 per cent of its natural nitrates; more than 90 per cent of its guano fertilizer; more than its share, 5.3 per cent of the lead; 11 per cent of the silver; more than its share, 5.6 per cent, of the world's tobacco; most of the world's tannin; 16.2 per cent, i.e., nearly four times its share of the world's tin; 11.1 per cent of the tungsten; 37.1 per cent of the vanadium; approximately 13 per cent of the world's hides, so important in many manufacturing industries like the shoe industry; and varying shares of many other commodities.

Taken in the aggregate, and making no reservations on account of inclusion in the population

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divisor for South America of some of the most economically backward peoples in the world, e.g., the Indians of the equatorial jungles, the South American hinterlands and fastnesses of the great Andean Mountain ranges, it is altogether likely that the total primary production per capita of all South America is not far behind that of all of Europe, exclusive of the Union of Soviet Socialist Republics. Nevertheless, the average per capita national income or its equivalent standard of living is at a level deplored by the leading statesmen and industrialists of the countries visited and, certainly, is far below that supportable by the resources to which reference has been made.

The fact on which attention is focused is the hazard to any people of placing too much reliance for their material welfare upon nature's bounties and the employment of manual labor, little supported by mechanical power, in the development of natural resources. In our own country, it is observed, despite a vast production of primary commodities by agriculture and mining at what is believed to be a high level of efficiency, the combined incomes to these divisions of the economy represent something of the order of 15 per cent of our national-income total. Figures could be used to make this clear but it probably will be more readily comprehensible if the reader will consider the value of the raw cotton in a man's cotton shirt or the value of raw hides in a pair of shoes or the value of the copper ingots in fine copper wire and compare these values with the corresponding factory sales values of the finished articles.

Manufacturing Absent

What then can be expected of the position of the economy of a country or a continent in which the emphasis is still placed essentially on the production of primary commodities and little upon their subsequent fabrication into the forms and natures needed to satisfy modern people? Not much over 1 per cent of the people of South America are engaged in manufacturing industries and, while there are examples of manufacturing plants which are the last word in layout and equipment, there is very extensive use of manually operated processes which in any economy suited to today's world competition would be power-operated. The reasons for the continued use of manual power in manufacturing are interesting and might make the subject matter for another complete monograph.

In passing from this phase of the subject, it should be noted again that South America has vast quantities of petroleum; that its coal resources are more extensive than current output indicates; that some of the coal reserves allegedly can be produced and delivered to industrial centers at very low cost; that even in certain of the areas where South American coal is not readily obtainable, there are considerable potential water-power resources. For example, it is understood that Brazil has water-power potentialities totaling upwards of 25 million horsepower. Of this aggregate, only 4 per cent has thus far been developed.

For us in the petroleum industry, there may be a lesson to be drawn from a study of South American economics. In our industry, we are just beginning to understand how much more we can do for the material welfare of our country when we process and improve upon the raw material which nature provides for us. Until very recent times, the great part of whatever chemical changes have been effected in the composition of the components of our raw materials has been essentially for the purpose of conserving reserves. We are now beginning to see, through the employment of very high-octane synthesized fuels and very stable synthesized lubricants, how nature can be improved upon, not only to effect a husbanding of the resource but also to effect much greater satisfactions in the utilization of the newer types of products and equipment. The prototypes of these latter-day products were derivable from crude petroleum by the simplest processes. Today we synthesize modestly. By this means we not only conserve petroleum but also lengthen the life of costly motors, increase speed and cruising radius of airplanes, improve flexibility of operations and reduce the amount of metal needed for an engine of any given size. These are some of the products of invention and research. More of both will be required of us in the years to come if we are to retain the lead which we have gained over other national economies and, particularly, if we are to enjoy a growing standard of living while, at the same time, assuming a large measure of responsibility for the postwar rehabilitation of devastated countries and for the effective economic organization of those countries now trailing far behind us We may come to see that there is an adverse effect upon us resulting from the inevitable impact of backward economies upon our highly organized economy; and, also, that we will prosper more as others prosper more.

It would be regrettable if what has preceded should leave an impression that South American economies are not growing. Indeed, between 1929 and 1938, the last year for which comprehensive data are available, the Latin-American nations, made up mostly of South American countries, have increased their position as producers of primary commodities by nearly 7 per cent, that is, they have more than held their own among world producers. Between 1938 and 1942, they will probably show still further improvement as a result of the demand made for their products by countries opposing the Axis powers. Moreover, some of the industrial and political statesmen of these countries have visioned the need for an industrial development requiring vastly more capital than can be supplied by the continent. Legal obstacles beset potential negotiations for the acquisition of much needed foreign capital. In the opinion of the writer, the nationalistic sentiment which has tended to exclude the entrance of foreign capital sprang into being much too soon in the history of South America's industrial development and has acted as a brake upon what might otherwise have been an example of the world's fastest industrial development.

Part of the explanation of the present level of national incomes and standards of living has already been offered in this reflection upon the South American economy. There are, of course, other items in the full explanation, not the least important of which is this very foreign ownership and control of certain natural resources and productive processes which has just been mentioned, and approved despite the fact that ownership and control by nationals would more effectively raise national income than ownership and control by foreign capital. The point, of course, previously implied was that any reasonable development of the continent's resources by foreign capital was better than no development at all.

There is an aspect of the continent's standard of living without a discussion of which these reflections would appear distorted. The standard of living of a very important part of South American populations is really much higher than many persons in our country are inclined to admit. It will not take long to show why this is the case. American misconceptions about the level of material welfare of the South American population and, particularly, of the peoples of South American cities no doubt originate partly from the stress laid upon the very low standards of the people of the jungles, hinterland and mountains, and partly from a faulty statistical approach.

The latter cause more particularly is considered here because it exemplifies a method often used in comparisons of the material welfare of urban dwellers of South American and North American cities. Frequently, the monetary earnings of South American workers are compared on a gold basis with the monetary earnings of workers of the same vocational classification in the United States and other economically highly organized communities. Unfortunately for the accuracy of such comparisons, the buying power of the South American currencies in terms of South American goods and services is not well understood and, therefore, not properly emphasized. Yet this is a matter of the greatest importance. A simple illustration will make this clear.

Wage Scales Low

In Chile, for example, a motorman of a trolley car will earn each month the equivalent of about 42 American dollars or about one-fourth the monthly compensation of a motorman in some American cities. From such a comparison, the hasty conclusion may be drawn that the South American motorman can maintain a standard of living only one-fourth as high as that of the American motorman. But this is a sadly erroneous conclusion. The fact is that nearly everything which the South American motorman buys is provided by labor which receives wages comparable in each of the several categories to his wages. For example, if he were to employ a domestic servant, during a family emergency, he would pay the Chilean peso equivalent of about $8 a month and "keep." If, under similar family stress, the American motorman attempted to employ a domestic servant, he would pay, probably from $40 to $50 a month and "keep."

An observation made along the road between Callao and Lime in Peru provides one of many

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Western Hemisphere Gains in Production Offset Other Losses

NEW YORK, Jan. 26.—An increase of 95,298,000 bbl. in the two principal producing countries of the Western Hemisphere, the United States and Venezuela, was more than sufficient to offset decreases elsewhere and, as a result, world production of crude oil in 1941 again established a new record. World production in 1941 is estimated at 2,209,761,000 bbl. against 2,142,255,000 bbl. in 1940, an increase of 67,506,000 bbl. or about 3 per cent.

War was responsible for the major changes in production such as the decreases for Iraq and Iran and the remarkable increase for Venezuela. Actual damage to oil properties was minor, however, since it was limited in the main to the small producing and refining region of western Soviet Russia. Anglo-Iranian Oil Co., Ltd., reported that "the interests of the company did not suffer seriously in the course of the disturbances in Iraq last May and in the occupation of Southern Iran by British forces in August." Against these minor losses were new discoveries and new extensions from Canada to the Netherlands East Indies which lifted the world's potential production to the highest point in history.

Venezuela accounted for the outstanding development of 1941. At the end of the year daily average production in Venezuela was the second highest in the world, having displaced Russia which ranked next to the United States for decades. Soviet production was greater for the year but if their respective current rates are maintained through 1942, Venezuela's total will exceed Russia's by a substantial margin.

Production in the Latin-American country totaled 228,125,000 bbl. in 1941, an increase of 41,991,000 bbl. over 1940. The daily average rose from 509,000 to 625,000 bbl. an increase of 22.6 per cent. As remarkable as this gain is it does not reveal the whole picture. In December, 1940, Venezuela's daily average production was down to 425,000 bbl. In the latter part of 1941 it had risen to as high as 750,000 bbl. per day, better than 75 per cent increase in the average.

Much of Venezuela's increase came from the eastern section of the country, principally from the Oficina, San Joaquin and El Roble fields. Eastern Venezuela also witnessed the discovery of several new fields and extensions to old ones. The Oficina-Guanta pipe line was extended to serve the Leona field and preparations were made for the construction of a 100-mile 12-in. line from the new Santa Barbara field to the Caribbean Coast. Central Venezuela's first field was indicated when a wildcat in Guarico, west of the Manapire River, found good oil shows.

United States Gains 4 Per Cent

United States crude-oil production increased about 4 per cent to 1,391,544,000 bbl. Because of this North America continued its dominant place in the world production picture. Combined production of the United States, Mexico and Canada represented 65.4 per cent of the world total. Mexico's development was centered in the Poza Rica field which accounted for 60 per cent of her production. Further extension of the Turner Valley field, where production was increased 1,516,000 bbl. in the year featured Canadian development.

Venezuela's increase raised South America's production above that of Europe for the first time. Argentina also contributed to South America's advance with an approximate 6 per cent increase. This was accounted for almost entirely by the Mendoza field. There were two discoveries reported in Argentina last year. Elsewhere in South America the changes were relatively minor though Colombia suffered a 10 per cent decline as a result of loss of markets abroad.

Russia dominated European production in a greater degree than did Venezuela in South America. Had it not been for the war with Germany, Soviet production probably would have exceeded 250,000,000 bbl. While only minor losses in production and refining facilities were suffered, the Russian oil industry lost a substantial portion of its normal market when Germany invaded the populous western area. This loss is believed to have more than offset gains in military requirements. Since Soviet production and consumption are in close balance this would have necessitated a cutback in production in the latter part of the year.

Rumanian Decline Continues

Rumania, Europe's second producing country, continued its decline. With a normally small domestic consumption, Rumania's industry is dependent on exports. Preliminary figures indicate that they declined 20 per cent from 1940. The loss of half her export customers was not offset by increased shipments to Germany, totaling about 15,000,000 bbl. in 1941 against 9,100,000 in 1940, and increased internal consumption resulting from the virtual German occupation. Europe's outstanding proportionate gain was Hungary's 75 per cent increase. Hungarian production exceeded 10,000 bbl. per day at the end of the year. Germany increased her production in Austria, Czechoslovakia, Poland and France but this plus the production of the old Reich was still far short of self-sufficiency for war and civilian needs.

Asia suffered the greatest losses in 1941 with production declining in all major areas outside of Burma and British India. Iraq suffered most heavily as the result of the complete closing of the Iraq Petroleum Co. pipe line to the Mediterranean for a part of the year. Iran suffered as the result of the transfer of the United Kingdom's main source of supply to the Western Hemisphere. This step was taken early in the year and had a pronounced impact on Iranian production. Declines in other Persian Gulf areas, Saudi Arabia and Bahrein island, were more moderate.

A somewhat similar situation, though not so pronounced, affected the Netherlands East Indies where exports were off 8 per cent in the first half of the year. A major decline developed in the second half when East Indian shipments to Japan, which had been averaging 35,600 bbl. per day, were suspended entirely. Exports from Tarakan, for example, were only 5,000 bbl. in August, 1941, against 465,000 bbl. in August, 1940.

ESTIMATED WORLD CRUDE-OIL PRODUCTION

(Figures in barrels)

	Total			Daily average	
	1941	1940	Change	1941	1940
United States	1,391,544,000	1,338,237,000	+53,307,000	3,812,450	3,656,386
U.S.S.R.*	235,000,000	225,000,000	+10,000,000	643,836	614,754
Venezuela	228,125,000	186,134,000	+41,991,000	625,000	508,563
Iran	64,150,000	79,290,000	—15,140,000	175,753	216,639
Netherlands East Indies†	61,000,000	65,150,000	—4,150,000	167,123	178,005
Mexico	41,165,000	43,470,000	—2,305,000	112,781	118,770
Rumania	38,750,000	42,500,000	—3,750,000	106,164	116,120
Colombia	24,400,000	26,864,000	—2,464,000	66,849	73,393
Argentina	21,770,000	20,476,000	+1,294,000	59,644	55,945
Trinidad	21,100,000	20,300,000	+800,000	57,808	55,464
Peru	12,800,000	12,451,000	+349,000	35,068	34,019
Canada	10,107,000	8,591,000	+1,516,000	27,690	23,473
Germany‡	9,980,000	9,275,000	+705,000	27,342	25,342
Iraq	9,875,000	25,450,000	—15,575,000	27,055	69,536
Egypt	8,050,000	6,550,000	+1,500,000	22,055	17,896
Burma	7,900,000	7,750,000	+150,000	21,644	21,175
Bahrein Island	7,070,000	7,200,000	—130,000	19,370	19,672
Saudi Arabia	4,250,000	5,350,000	—1,100,000	11,644	14,618
Japan§	3,800,000	3,840,000	—40,000	10,411	10,492
Hungary	3,300,000	1,875,000	+1,425,000	9,041	5,123
British India	2,245,000	2,150,000	+95,000	6,151	5,874
Ecuador	1,650,000	2,475,000	—825,000	4,521	6,762
Italy¶	1,250,000	1,480,000	—230,000	3,425	4,044
Bolivia	275,000	237,000	+38,000	753	648
Others	205,000	160,000	+45,000	562	437
Total	2,209,761,000	2,142,255,000	+67,506,000	6,054,140	5,853,150

*Includes part of Sakhalin and for preinvasion period Ukraine and part of Poland. Does not include natural-gasoline production. †Includes Sarawak and Brunei. ‡Includes Poland, Austria, Czechoslovakia and Pechelbronn fields in Alsace. §Includes Formosa, part of Sakhalin. ¶Includes Albania.

Expansion of Pipe Lines Is Vital to War Program

By PAUL REED

American industry and governing bodies discovered in 1941 the necessity for vast pipe-line expansion for safe and adequate transportation for supplies required for maintaining the activities of the nation's war program. For the first time large systems have been built to displace tanker shipments. Refined products lines have been increased one-third because of their efficiency. New natural-gas lines are needed to serve industrial centers. These increases in pipe-line construction have been accomplished in spite of unusual obstacles. The current year promises to be another active pipe-line period.

FOLLOWING expansion in 1941 which broke preceding records, the pipe-line industry continues to carry on a considerable construction program through the winter months when work is normally retarded. Reports indicate that more than 8,000 miles of trunk line, loops and laterals were added to crude oil, gasoline and natural-gas systems during the past year. Construction of such lines in 1940 was 6,000 miles; in 1939, 5,000 miles; in 1938, 2,500 miles; and in 1927, 2,000 miles. Recent achievements have been accomplished in spite of numerous delays in getting equipment.

In the first half of the year several large pipe-line undertakings were held up by various legal obstructions. The way was cleared for nearly a quarter of the pipe-line mileage of 1941 projects by the passage of the Cole right-of-way bill. Some proposed lines have been held up by objections of competing interests to the granting of permits by state and federal bodies. Furthermore, the pipe-line industry has entered a period during which it must operate under reduced transportation rates.

Probably the outstanding feature of the year has been the widespread recognition of the important function of pipe lines in the war program of the United States. For the first time in the history of the industry pipe-line systems have been put in operation which relieve the load on tanker transportation. Altogether, such systems which have been put in operation during the year, or are approaching completion, extend a total of more than 2,000 miles. They include: Southeastern Pipe Line Co., Port St. Joe, Fla., to Chattanooga, Tenn., 450 miles; Portland-Montreal crude-oil line, 235 miles; Plantation Pipe Line Co., Baton Rouge, La., to Greensboro, N. C., 1,260 miles; and Shell Oil Co., Inc., Fall River to Worcester and Waltham, Mass., 86 miles. With the exception of the Portland-Montreal line these are all gasoline lines. Recognition of the national significance of these undertakings has been attested by the dedication ceremonies at the opening of three of these systems.

New Lines for War Needs

A feature of the 1941 program was the large mileage for new lines laid outside of the regions which have been regarded as the principal pipe-line territory. Lines completed in the northeastern states, southeastern states, and the states included in the Missouri River Valley region total more than 3,200 miles, more than the entire mileage laid in the country in 1938. Most of this construction was for gasoline lines, now frequently designated as products lines. The building of these started off in the spring with a program of extension of old lines and construction of new ones totaling about 840 miles to Des Moines and Council Bluffs, Iowa, and Sioux Falls, S. D., to serve Globe Oil & Refining Co., Socony-Vacuum Oil Co., Inc., and Standard Oil Co. (Indiana). During the year, gasoline pipe lines were expanded by nearly a third, bringing the total mileage for lines of this kind from 9,500 miles to 12,600 miles. At the same time crude-oil pipe-line mileage was increased from 116,900 miles to 120,000 miles and natural gas pipe-line mileage was increased from 190,000 miles to 192,000 miles.

To accommodate the increased loads thrown on pipe lines of all kinds leading to northern cities there was a large amount of looping of trunk systems. More than 1,000 miles of loops were laid during the year. Early in the spring work started for a program of Stanolind Pipe Line Co., calling for the construction of 160 miles of pipe laid in sections along the trunk system which make it possible to segregate three grades of crude moved from Texas and Oklahoma to northern refineries. Loops previously installed as well as the new sections were utilized in carrying out this plan. For enlarging outlets from Kansas and Wyoming fields, Stanolind has been laying 116 miles of 10-in. and 12-in. loops in connection with the part of the trunk line between Washington, Kans., and Freeman, Mo.

Gulf Refining Co., Tulsa Pipe Line Division, laid 202 miles of 10-in. loops between Glenn Pool, Oklahoma, and Dublin, Ind.

Phillips Petroleum Co. is laying 72 miles of 8-in. loops in Missouri to enlarge the capacity of the gasoline trunk line.

Much attention has been drawn to the construction of 405 miles of 26-in. pipe in the looping program of Natural Gas Pipeline Co. of America which actually represents the laying of nearly half the pipe for an additional line which the company contemplated constructing for operation in connection with its present Chicago trunk line in order to serve markets in Wisconsin, even though the company has not been able to obtain permission to enter that state. This project is unique because of the use of thin-walled pipe and factory bends.

The armament program of the nation is responsible for a number of pipe-line undertakings. Most of these are natural-gas lines built by United Pipe Line Co., and Southern Natural Gas Co., for serving industrial centers in the Southeast. There has been much pipe laid in short lines to Army posts and flying fields in the Southwest and the Southeast. Nearly 100 miles of pipe has been laid for the various pipe-line companies which have been required to move trunk lines from military reservations recently acquired by the Government for munition plants. The value of the gasoline lines in the southeastern states for military establishments in the area has been recognized by the Government. Furthermore, the importance of these recent pipe lines for the Navy is readily apparent from the fact that nearly all of the refined products reaching the area served by the Plantation and Southeastern systems has been transported customarily by tanker. The Portland-Montreal crude-oil line was strongly endorsed by the Navy because it makes possible the elimination of 2,000 miles of tanker haul. There is a possibility that increased naval hostilities along the Atlantic Coast may lead to the construction of a new line from Texas to the New York-Philadelphia area. Both crude oil and gasoline lines have been considered. Complete aerial surveys and some ground surveys have been made for a crude-oil system which would connect East Texas and Wood River, Ill., with the East Coast refineries. This 1,586-mile line which was planned for construction in the fall of 1941 was not authorized by the Government; plate desired for construction of 16-in., 22-in. and 24-in. pipe was demanded by the national ship-building program. Facilities for making pipe with plates are capable of producing such pipe faster than it could be laid conveniently. Pipe in these large sizes can be made at a somewhat slower rate by seamless mills.

Prospects for 1942

Because of the shortage of transportation facilities due to withdrawal of approximately 80 tankers for British service during the summer and fall, tank-car shipments from pipe-line loading racks increased to nearly 150,000 bbl. per day during the peak period. With the return of a large part of this tanker fleet, such shipments were later drastically curtailed

It is too early to determine just what effect the synthetic rubber manufacturing program will have on the pipe-line industry. There may be an increasing demand for pipe-line transportation of butane to the plants which are to make butadiene.

Several projects are pending for the 1942 construction season. The 826-mile 20-in. natural-gas line of Hope Natural Gas Co. from the Monroe, La., area to West Virginia has been definitely announced. Panhandle Eastern Pipe Line Co. has already made some headway in the construction of 433 miles of lines in sizes from 4-in. to 26-in. to serve points in Illinois and Michigan. Phillips Petroleum Co. has obtained a permit from the State of Wisconsin to serve the state and has announced intention of laying an 820-mile 22-in. line from the Texas Panhandle to Wisconsin cities. Standard of New Jersey interests are surveying for a crude-oil line from the Tinsley field, Mississippi, to Baton Rouge, La.; however, authorization by the Government must be obtained before work can proceed.

Sinclair interests are now engaged in laying pipe for a 350-mile gasoline line across Pennsylvania and for a 100-mile crude line in eastern Venezuela.

If government officials continue to recognize the vital function of pipe lines in the war program the prospects are that 1942 will prove to be another active construction year.

Outlook for Refinery Market Is Clouded by Exigencies of War

By H. STANLEY NORMAN

OUTLOOK for petroleum-product markets this year is the most uncertain faced by the nation's refiners in more than 20 years. Vicissitudinous alterations in the petroleum-product markets are in prospect, the result of an abrupt switch to a war economy, ramifications of which are gradually becoming apparent in their proper perspective.

Beguiling refiners at the start of a total-war year are estimates on 1942 gasoline consumption in the United States ranging from an increase of 1.5 per cent to a decrease of 35 per cent. Probably never in the 83-year history of the petroleum industry has there been such a disparity in figures on prospective demand.

Two positive factors stand out as tangibles that the refining industry can view with certainty. They are: (1) Assurance that this year and next will require record expenditures for equipment with which to recover aviation-gasoline components and hydrocarbons that may be synthesized into rubber or chemicals; and (2) probability that petroleum will continue among the commodities over which a price ceiling will prevail for duration of the war.

Operation of the price ceiling, a war-economy control that is one-sided in that there is no reciprocating floor, was in evidence throughout the last half of 1941. Four actions of the Office of Price Administration scattered over the last 5 months of last year are considered typical of the federal administrator's attitude toward petroleum prices. An advance of 23 to 28 cents per barrel in the posted price for Pennsylvania crude in August was rescinded; a plea for permission to raise Mid-Continent crude 25 cents per barrel, originally filed in midyear, was denied in September; a lift of 7 cents in North Texas crude in November was nullified and, finally, in January, suppliers of residual fuel oil were prohibited from making a proposed advance of 15 to 25 cents per barrel in Bunker C and No. 6 quotations.

The only breakthroughs in the petroleum price ceiling occurred in May when California crude purchasers were finally sustained in an advance in postings that averaged 7 cents per barrel and early in December when buyers in 23 North Texas counties were authorized to increase bids 3 cents.

Refiners find certain compensatory results from the price ceiling because, while bulk quotations have been ordered held at levels prevailing November 7, 1941, there is reasonable assurance that crude costs will be held in the same general relationship. Chief concerns of refiners are whether they can afford expenditures required by the Government's aviation-fuel and synthetic-rubber programs with prices pegged.

Part of the $550,000,000 involved in the aviation-gasoline and synthetic-rubber programs of the Government will be available from the federal Treasury. But the industry itself will have other expeditures related to general plans for producing 150,000 bbl. of 100-octane gasoline daily and 400,000 tons of synthetic rubber that cannot be yet even approximated. Fighting-grade aviation gasoline and synthetic rubber are the end products and hardly any of the estimated cost will cover the primary and intermediate facilities required to implement the program.

Ramifications that clouded the outlook for 1942 and beyond, if the war continues, mostly developed after Pearl Harbor was bombed and the Philippines attacked December 7. Civilian restrictions that were nebulous at best during the earlier stages of the war congealed rapidly and fell heaviest on the American automobile driver.

Throughout 1941, a review on the curves of refinery-product prices discloses, petroleum markets were nearly as strong on the average as those prevailing in 1937. The 1941 average Pennsylvania and Mid-Continent price of several products, including natural gasoline, kerosene, neutral lubricating oils and wax, were the highest in 10 years. California markets were an exception to the general rule. The failure of Pacific Coast petroleum prices to make a better showing is owing to disturbed conditions in the Pacific which became acute from midyear forward.

Exports of petroleum to Japan which averaged 46,500 bbl. daily during the first few months of 1941 were ceased completely July 26, diverting this volume of crude and products to the domestic Pacific Coast market. California refiners were unable to make adequate adjustment and a slump of key-product prices below the 1940 averages resulted. California crude, using Signal Hill postings for 25° A.P.I. gravity oil as a base, was restored to levels prevailing in 1937, 1938 and 1939.

The outstanding market record for 1941 was established by natural gasoline in the Mid-Continent and Texas. Mid-Continent quotations for 26-70 grade natural (basis, Oklahoma Group 3) rose to an average of 3.83 cents per gallon last year, an increase of 1.86 cents over the 1940 price. Natural gasoline, in the eastern part of the country, started upward at the end of February and rose to 3.375 cents in the middle of May. The curve leveled off until August 1. Another series of increases carried the market to 5.125 cents at the start of October and it held there for the remainder of the year.

The average price of refinery gasoline at five basic domestic marketing points in the United States touched 5.925 cents per gallon in 1941, an increase of 0.770 cent over the average of 5.155 cents at the same points a year ago. This comparison of averages includes California prices which were down 0.4 cent per gallon for the year.

Exclusive of California, the average refinery-gasoline price in 1941 was 5.918 cents per gallon, or 1.604 cents higher than in 1940.

Another indication of the general improvement in petroleum prices for 1941 is disclosed in Department of Labor indexes of wholesale prices.

AVERAGE YEARLY PRICES ON MOST IMPORTANT REFINERY PRODUCTS, 1932, TO JANUARY 1, 1942

PRICES IN TANK CARS AT PLANTS

MID-CONTINENT, BASIS OKLAHOMA (GROUP 3)

	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932
Regular gasoline (72-74 octane) per gallon	$.0547	$.0451	$.0487	$.0503	$.0582	$.0588	$.0492	$.0444	$.0363	$.0392
Natural gasoline, 26-70, per gallon	.0383	.0197	.0317	.0271	.0367	.0361	.0320	.0260	.0290	.0222
41-43 water-white kerosene, per gallon	.0429	.0382	.0367	.0407	.0413	.0365	.0353	.0322	.0279	.0315
Fuel oil, 8 to 14 gravity, per barrel	.7635	.4875	.4597	.5509	.7780	.6619	.6232	.5930	.3899	.3250
200 vis. neutral, 3 color (10-25 pour point), per gallon	.1111	.1049	.1100	.1000	.0996	.1043	.1075	.0994	.0845	.0834
150-160 D color bright stock (10-25 pour), per gallon	.1750	.1787	.1674	.1491	.1859	.1769	.1496	.2030	.1852	.1837
124-126 wax, per pound	.0416	.0406	.0350	.0230	.0286	.0245	.0224	.0346	.0253	.0170
Crude (36 A.P.I. gravity), per barrel	1.1200	1.0200	1.0200	1.1900	1.2100	1.1000	1.0000	1.0000	.6200	.8800

CALIFORNIA

	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932
Regular gasoline (72-74 octane), per gallon	$.0596	$.0636	$.0621	$.0677	$.0737	$.0602	$.0552	$.0624	$.0523	$.0546
Natural gasoline, 75-85 375 end point, per gallon	.0450	.0516	.0598	.0639	.0676	.0617	.0506	.0575	.0462	.0447
38-40 kerosene, per gallon	.0450	.0450	.0473	.0510	.0432	.0339	.0409	.0458	.0384	.0398
27 plus diesel*	1.1000	1.1300	.9466	1.1900	1.1750	1.0350	1.0840	1.0320	.8406	.7432
Crude (25 A.P.I. gravity, Signal Hill), per barrel	1.0300	.9600	1.0300	1.0300	1.0300	.9970	.8500	.9400	.8400	.8300

PENNSYLVANIA

	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932
Regular gasoline (74-76 octane), per gallon†	$.0690	$.0608	$.0453	$.0487	$.0544	$.0565	$.0521	$.0519	$.0505	$.0568
45 water-white kerosene, per gallon	.0566	.0485	.0485	.0501	.0507	.0504	.0467	.0448	.0446	.0451
Bright stock, 10-15 pour point, per gallon	.2425	.2053	.2079	.1671	.2422	.2361	.1990	.2540	.2407	.2466
Crude in National Transit Lines (Bradford field), per barrel	2.5600	2.3300	2.0600	1.8900	2.6400	1.4200	2.1700	2.4700	1.8600	1.8800

*1936, 1937, 1938, and 1939 prices are on 24 plus diesel. †Previous to 1940 below 60 octane.

The latest month for which data are available, the petroleum-price index increased to 61.7. Figures are based on 1926 averages equaling 100 per cent. A year ago, the index of petroleum prices stood at 49 per cent. The climb to higher levels started in March when prices were raised for crude, gasoline, fuel oil, natural gasoline and lubricating oils. The increase of 20 per cent in the index of petroleum prices is sharper than gains registered by most other commodities. However, the current level of 61.7 for petroleum still is 15 to 40 index points behind other commodities consumed on a national scale.

A phase of refinery markets that are not reflected in the price averages for civilian products is the aviation fuel purchased by the United States military services and for lend-lease assistance to Allies. Prices for 100-octane gasoline contracted by the Army and Navy have been in the range of 15.5 to 18.5 cents per gallon, depending on delivery points specified in the bid invitations.

High octane motor fuel, ranging from 80 to 83 numbers, research method, has enjoyed a strong demand on the Gulf Coast for several months. Most of this grade of fuel is earmarked for lend-lease delivery to Great Britain. Lend-lease nature of this business supplied by open bids has permitted Gulf refiners to make full use of facilities for producing quality material without violating price ceilings established by OPA.

AVERAGE DOMESTIC AND EXPORT REFINERY PRICES DURING PAST THREE YEARS

(QUOTATIONS F.O.B. PLANTS AND TERMINALS)

	1941					1940					1939				
GASOLINES—															
Oklahoma (Group 3):	Av. pr.			1st	2nd	Av. pr.			1st	2nd	Av. pr.			1st	2nd
U. S. Motor grades:	for yr.	High	Low	6 mos.	6 mos.	for yr.	High	Low	6 mos.	6 mos.	for yr.	High	Low	6 mos.	6 mos.
Regular, 72-74 octane	$.0547	$.0600	$.0438	$.0493	$.0600	$.0451	$.0475	$.0425	$.0451	$.0450	$.0487	$.0525	$.0438	$.0464	$.0510
Third grade, below 62 octane	.0454	.0525	.0363	.0383	.0525	.0374	.0388	.0325	.0387	.0360	.0405	.0450	.0325	.0377	.0433
Pennsylvania:															
74-76 (regular)*	.0690	.0750	.0550	.0630	.0750	.0608	.0663	.06	.0616	.06	.0453	.05	.0425	.0438	.0468
California:															
58-60 400, 72-74 octane†	.0596	.0650	.0550	.0562	.0630	.0636	.07	.0550	.0694	.0578	.0621	.0650	.06	.0619	.0623
New York (Bayonne, N. J.):															
72-74 octane	.0704	.0800	.0500	.0617	.0790	.0581	.0650	.0450	.0620	.0541	.0618	.0650	.06	.0608	.0627
Gulf Coast (domestic:															
Regular, 72-74 octane‡	.0564	.0637	.0350	.0477	.0628	.0443	.06	.0350	.0492	.0393	.0526	.0650	.0512	.0472	.0579
NATURAL GASOLINES—															
Oklahoma (Group 3):															
Grade 26-70	.0383	.0512	.0238	.0284	.0482	.0197	.0275	.0150	.0178	.0216	.0317	.0425	.0250	.0265	.0368
Grade 18-55	.0434	.0612	.0275	.0332	.0535	.0223	.0325	.0150	.0210	.0235	.0376	.0512	.0275	.0315	.0436
California:															
75-85 375-390	.0450	.0450	.0450	.0450	.0450	.0516	.0575	.0450	.0567	.0464	.0598	.0650	.0550	.0630	.0566
KEROSENE—															
Oklahoma (Group 3):															
41-43 water white	.0429	.0437	.0413	.0420	.0437	.0382	.04	.0363	.0384	.0379	.0367	.0388	.0337	.0378	.0356
Pennsylvania:															
45 water white	.0566	.0637	.0513	.0523	.0680	.0485	.05	.0450	.0489	.0481	.0485	.05	.0450	.0489	.0481
California:															
38-40 high-burning test	.0450	.0450	.0450	.0450	.0450	.0450	.0450	.0450	.0450	.0450	.0473	.0475	.0450	.0475	.0471
New York (Bayonne, N. J.):															
41-43 water white	.0520	.0550	.0460	.050	.0540	.0536	.0590	.0480	.0568	.0503	.0460	.0520	.0437	.0450	.0469
Gulf Coast:															
41-43 water white	.0359	.0400	.0325	.0336	.0381	.0424	.0450	.0375	.0450	.0397	.0391	.0450	.0350	.0370	.0411
FURNACE OILS AND TRACTOR FUELS—															
Oklahoma (Group 3):															
38-42, No. 1 prime white	.0382	.0388	.0350	.0377	.0387	.0353	.0375	.0325	.0363	.0343	.0336	.0363	.0312	.0340	.0331
32-36, No. 2 straw	.0348	.0363	.0338	.0342	.0355	.0334	.0350	.0325	.0339	.0328	.0303	.0338	.0275	.0304	.0302
New York (Bayonne, N. J.):															
No. 1	.0506	.0550	.0460	.0502	.0510	.0534	.0590	.0480	.0564	.0503	.0441	.05	.04	.0435	.0446
No. 3	.0483	.0520	.0400	.0456	.0510	.0470	.0540	.0410	.0508	.0431	.0397	.0425	.0375	.0397	.0396
GAS OIL, DIESEL OIL, AND FUEL OIL—															
Oklahoma (Group 3):															
No. 6 fuel oil, industrial, 8-14	.7635	.8500	.6000	.6769	.8500	.4875	.50	.45	.4750	.50	.4597	.5250	.40	.4654	.4540
California:															
30-40 gas oil, per barrel§	1.10	1.10	1.10	1.10	1.10	1.13	1.15	1.10	1.15	1.10	.9466	1.15	.80	.97	.9231
New York (Bayonne, N. J.):															
28-30 diesel (lighterage 6¼ cents bbl.)	1.93	2.15	1.65	1.86	2.10	1.93	2.20	1.70	2.07	1.79	1.695	2.10	1.65	1.67	1.72
Bunker C (New York Harbor)	1.38	1.50	1.15	1.41	1.35	1.34	1.50	1.15	1.47	1.20	1.04	1.50	.95	.96	1.12
NEUTRAL OILS—															
Oklahoma (Group 3):															
200, 3 color, 10-25 pour point	.1111	.1450	.0800	.0869	.1353	.1049	.14	.08	.1260	.0837	.11	.14	.10	.10	.12
Pennsylvania:															
200, 3 color, 10 pour point	.3295	.3950	.2350	.2669	.3920	.2588	.34	.2350	.2825	.2350	.2208	.34	.17	.1810	.2606
Gulf Coast:															
200, 3 pale oil	.0777	.0850	.0713	.0716	.0827	.0720	.0725	.0713	.0725	.0715	.0699	.0725	.0650	.07	.0697
California:															
200, 2½-3 pale oil	.0717	.0725	.0700	.0725	.0709	.0725	.0725	.0725	.0725	.0725	.0725	.0725	.0725	.0725	.0725
BRIGHT AND STEAM-REFINED STOCKS—															
Oklahoma (Group 3):															
150-160, zero to 10, D color	.1750	.2300	.1350	.1500	.2200	.1787	.25	.1350	.2192	.1382	.1674	.25	.1425	.1425	.1922
Pennsylvania:															
600 S.R.	.1155	.1500	.0800	.0946	.1424	.1056	.18	.07	.1386	.0725	.0996	.1750	.08	.0831	.1161
Bright stock, 10 pour point	.2425	.3050	.1450	.1900	.2950	.2053	.35	.1450	.2620	.1485	.2079	.35	.15	.1733	.2425
WAX—															
Oklahoma (Group 3):															
124-126 (crude scale)	.0416	.0600	.0250	.0283	.0548	.0406	.0675	.0250	.0537	.0274	.0350	.0675	.0235	.0256	.0444
New York (Bayonne, N. J.):															
125-127 (A.m.p.)	.0560	.0560	.0560	.0560	.0560	.0590	.0675	.0560	.0617	.0562	.0419	.0650	.0360	.0367	.0470
EXPORT PRICES—															
Gasoline—Gulf Coast:															
60-62 400	.0462	.0550	.0325	.0391	.0532	.0429	.0513	.0363	.0479	.0378	.0449	.05	.0425	.0428	.0469
64-66 375	.0455	.0575	.0325	.0340	.0570	.0447	.0575	.0388	.0502	.0391	.0530	.07	.04	.0437	.0622
Los Angeles, Calif.:															
U. S. Motor, 60-65 octane	.0482	.0525	.0450	.0456	.0507	.0517	.0550	.0450	.0545	.0488	.0468	.0550	.0425	.0458	.0477
U. S. Motor, 65-69 octane	.0549	.0575	.0525	.0531	.0566	.0563	.0575	.0525	.0575	.0550	.0495	.0575	.0450	.0483	.0507
Lubricants—New York (f.a.s. in bbl):															
600 S.R. unfiltered	.2042	.2650	.1600	.1750	.2333	.1832	.25	.1550	.2060	.1603	.1842	.28	.16	.16	.2084
Bright stock, 25 pour point	.2817	.3600	.2700	.2290	.3344	.2730	.40	.20	.3340	.2120	.2324	.40	.1625	.1625	.3022

*Below 60 octane, 1939. †54-58 gravity (65 octane and higher), 1939. ‡68-70 octane, 1939. §27 plus diesel, 1939 and 1940.

Oil Trade Balance Nears With Export Decline, Import Gain

By J. P. O'DONNELL

NEW YORK, Jan. 27.—Petroleum exports from the United States continued downward last year, falling to the lowest total reported since 1932. The rise of imports was again extended for the third consecutive year and the total of 93,549,000 bbl. is the heaviest draft on foreign petroleum production by this country since 1930.

Preliminary data disclose that the end toward an unfavorable trade balance, an excess of imports over exports, was continued for the third successive year. Imports of all oil rose while exports declined to 105,909,000 bbl. There was a difference of 12,360,000 bbl. in favor of exports which, compared with a difference of 139,168,000 bbl., in 1938, the year before the current trend started.

Detailed Department of Commerce reports of the United States oil trade with foreign countries were suspended early in 1941 and summarized Bureau of Mines figures were terminated later.

The trend of declining exports and increasing imports has brought the trade balance into the closest relationship since 1923 when a condition favorable to the United States was reestablished after a lapse of 3 years. Whether this trend will continue in 1942 is problematical. Prior to the entrance of the United States into the war, most petroleum economists anticipated a slight gain in exports of refined products in 1942. However, two-thirds of the reduction in exports last year was in crude oil and a similar reduction in 1942 would offset entirely the expected gain in refined-products exports. On the other hand if transportation facilities are available, there probably will be another increase in imports since the volume to be admitted under the reduced tariffs granted by the Venezuela trade agreement will be up about 9 per cent.

Change Began in 1939

The change in our foreign oil trade balance began with the war in 1939. Exports fell slightly in that year and imports rose about the same amount. The decisive reversal of the former trend came in 1940 when exports fell 58,000,000 bbl. and imports rose 25,000,000 bbl. In 1941 exports dropped 24,490,000 bbl. or 18.8 per cent while imports increased 9,798,000 bbl., a gain of 11.7 per cent. The trend of imports and exports is shown statistically for the past 15 years in Table 1 and graphically since the first World War in the chart. Data for 1941 used here and elsewhere in this review are estimates prepared by the statistical department of the American Petroleum Institute.

As previously mentioned, exports of crude oil declined more last year than did those of refined products. The former dropped from 51,496,000 bbl. in 1940 to 35,500,000 bbl. in 1941, a decline of 15,996,000 bbl., which was equal to 31 per cent. To appreciate the full effect of the war it is necessary to compare 1941 with prewar 1938, when crude exports totaled 77,254,000 bbl. In 1941, crude shipments were 41,754,000 bbl., or 54 per cent lower. As a result of this decline, exports are of decreasing importance to the domestic industry. Last year they represented less than 2.5 per cent of total crude-oil demand against 6.2 per cent in 1938.

Refined-oil exports dropped from 78,970,000 bbl. in 1941 to 70,409,000 bbl. in 1941, a reduction of 8,561,000 bbl.; about 11 per cent. In comparison to 1938, when they totaled 116,474,000 bbl., the 1941 product exports represented a decline of 46,065,000 bbl., or 40 per cent.

Distillate Fuel Oil Heaviest Sufferer

From a volume standpoint, distillate fuel oil suffered most in the loss of export markets last year. These exports dropped 2,840,000 bbl. to 16,300,000 bbl. Proportionately the decline in kerosene was greater. Exports of this product dropped 863,000 bbl. to 2,512,000 bbl., a decline of 25.8 per cent against 14.8 per cent for distillate-fuel oil. Percentage declines in foreign shipments of the other major petroleum products last year were: Motor fuel, 7.2 per cent; residual fuel oil, 14.8 per cent and lubricating oils 9.2 per cent. Exports represented an important part of the total market only for lubricating oils. and distillate fuel oil. They accounted for 23.6 per cent of the lubricating-oil market and 8.6 per cent of the distillate fuel-oil market, but only from 3.4 to 3.7 per cent of the demand for gasoline, residual fuel oil and kerosene.

Last year's increase in imports lifted them to the highest point since 1930 just as the decline in exports dropped the latter to the lowest point since 1932. With the exception of 1932, exports were the lowest since 1923. Imports increased in 1941 to 93,549,000 bbl., a gain of 9,798,000 bbl., or 11 per cent from 1940. Bulk of the increase was accounted for by refined products, imports of which rose 7,172,000 bbl. against a gain of 2,626,000 for crude oil. Imports continued to play a minor role in the total United States picture. Combined crude and refined oil imports last year were 5.9 per cent of total United States demand against 4.1 per cent in 1938.

TABLE 1—UNITED STATES OIL IMPORTS-EXPORTS 1927-1941

(Thousands of barrels)

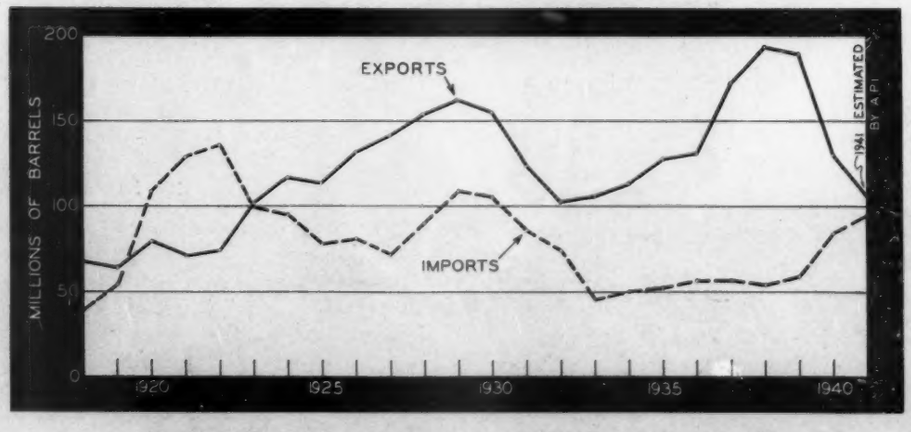
Year	Exports	Imports	Balance
1941	105,909	93,549	12,360
1940	130,399	83,751	46,648
1939	188,673	59,060	129,613
1938	193,476	54,308	139,168
1937	172,346	57,157	115,189
1936	131,545	57,104	74,441
1935	127,801	52,635	75,166
1934	114,276	50,494	63,782
1933	106,526	45,394	61,132
1932	103,198	74,494	28,764
1931	123,873	86,087	37,786
1930	155,437	105,618	49,819
1929	162,326	108,710	53,616
1928	154,449	91,557	62,892
1927	141,649	71,736	69,913

TABLE 2—COMPARISON OF EXPORTS, 1940-1941

(Thousands of barrels)

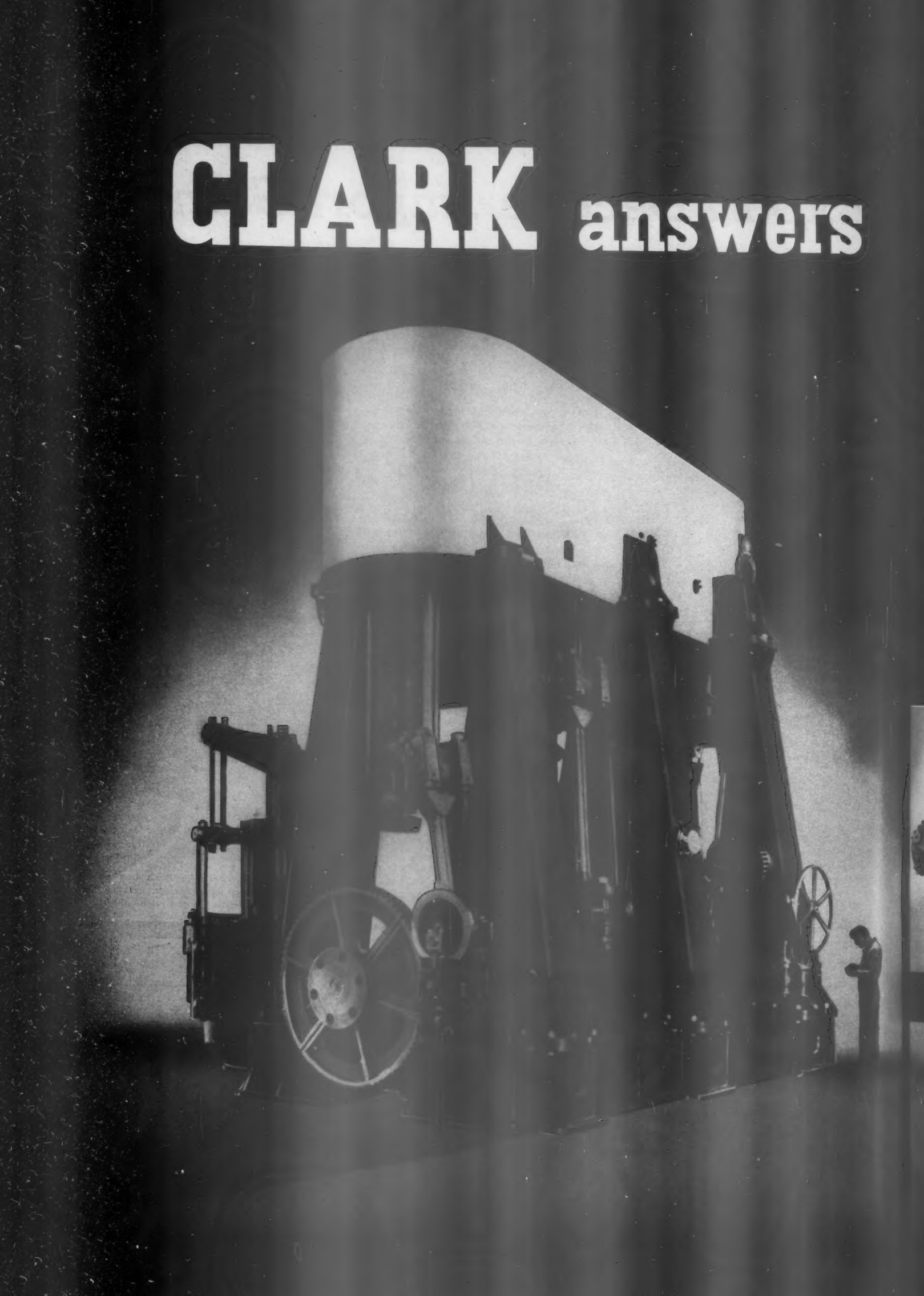
Product—	1941	1940	Change
Crude oil	35,500	51,496	—15,996
Motor fuel	23,570	25,377	—1,807
Distillate fuel oil	16,300	19,140	—2,840
Residual fuel oil	14,527	16,109	—1,582
Kerosene	2,512	3,374	—862
Lubricating oil	9,500	10,461	—961

Tanker taking cargo at one of the South American oil ports for transport to world markets, including the United States which received largest volume since 1930



Curves of United States petroleum exports and imports drew nearer in 1941

CLARK answers



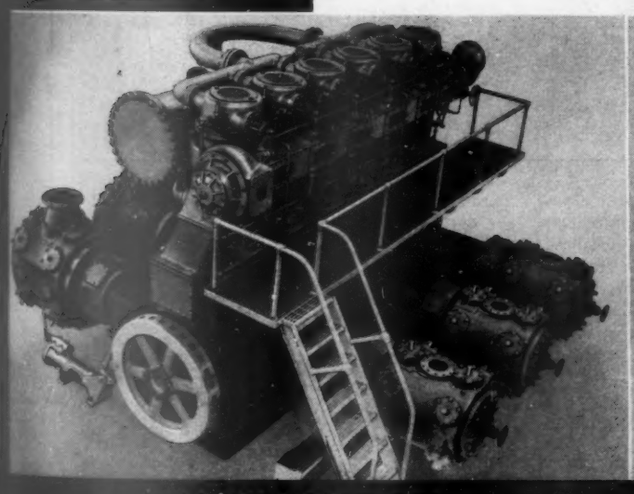
the Call to Arms!

AT A TIME when many believe that Democratic ideals are engaged in a fight to the death with the powers that oppose them — CLARK has felt it a tremendous privilege to be able to place its technical knowledge, training and facilities at the disposal of the Government of the United States.

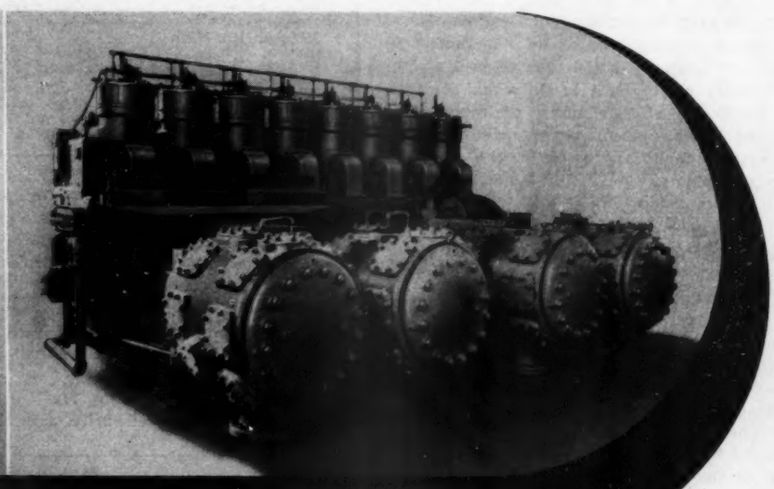
CLARK'S major defense assignment to date has been the manufacture of the Triple-Expansion Marine Steam Engine shown at left. This is similar to the units that CLARK built during the previous war. You can judge from the photograph on the opposite page the size of this huge machine. These engines are being built in the new 200-foot extension to the Olean plant.

CLARK is also building for the High Octane Gasoline Program their Standard Two-Cycle "Angle" Gas Engine Driven Compressors. To increase production of these compressors, new machine tools have been installed, production lines have been increased and all facilities and resources are being directed toward speeding up this very important program.

In addition to the above, CLARK is building for the Chemical Industry large High Pressure "Angle" Steam Engine Driven Compressors in sizes up to 4000 horsepower for compressing nitrogen and other gases used in the manufacture of explosives.



CLARK 3,000 H. P. Steam Driven "Angle" Compressor, now in service in ammonia synthesis plants



CLARK 800 H. P. Gas Driven "Angle" Compressor, now aiding in manufacture of 100 Octane Aviation Gasoline

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Ceiling on Gasoline Prices Keep Motorists' Costs at Low Figure

By H. STANLEY NORMAN

MOTORISTS of the United States entered their first year of total war since 1918 paying nearly 0.5 cent per gallon less for gasoline than the average for the past 10 years. The increase of nearly 0.3 cent per gallon in the average service-station price, exclusive of taxes, for 1941, developed almost entirely in the second and third quarters of the year.

The advance of 0.3 cent per gallon in the retail price of motor fuel was considered inadequate to offset the prospective decline in revenue normally derived by service stations through the sale of automobile tires and accessories. Requirements for metals in the war program reduced the manufacture of automobile accessories to a minimum even before the United States entered the conflict as a shooting belligerent. Tire and accessory sales are the profit business for many retail petroleum outlets.

The retail-gasoline market improvement of 0.29 cent per gallon for the country as a whole was confined to the southeastern states of Georgia, Alabama, Mississippi, Florida, Kentucky and Virginia. The southeastern states as a group registered an improvement in the average price of motor fuel at service stations amounting to 0.29 cent per gallon during the year. Markets in the southeastern states were permitted to rise during the third quarter in an effort by the Office of Price Administration to compensate for higher delivery costs. Advances were made at several southeastern key points in the early part of July, others came in August, September and October.

The tanker shortage, caused by diversion of 80 American oil boats to British service in May and June, became most acute in July and August. Many southeastern distributors of motor fuel were compelled to use more expensive overland transportation facilities to offset the lack of marine equipment.

Retail gasoline prices in numerous cities, particularly those in the North Atlantic and New England area and in the Pacific Coast remained static from midyear through December, a condition that extended into the current month and threatened to persist indefinitely.

Petroleum marketing organizations are operating under direct request from Leon Henderson, the price administrator, to refrain from advancing quotations without first consulting with his office. There have been surprisingly few permits issued by Mr. Henderson for higher prices in view of the greater cost of transporting materials from refineries to the points of distribution.

The factor of marketing costs is almost certain to go higher as the year progresses because privately owned tank trunks are among the classes of vehicles for which tire replacements receive no special consideration. Refiners and their affiliated or contract customers consider it probable that most distribution, except local, will be of necessity diverted to the railroads before many months expire.

Price averages in the accompanying tables are computed by The Oil and Gas Journal on the basis of approximate margins and represent the revenue accruing to the oil industry, exclusive of taxes. Dealer tank-wagon quotations are used as the base in the interpolations for most areas. Taxes are deducted and the service-station margin added to arrive at the prices paid for gasoline.

Year-to-Year Trend of Retail Gasoline Prices

Average Service-Station Prices in Cents in 50 Representative Cities, Exclusive of Tax

	1933	1934	1935	1936	1937	1938	1939	1940	1941
January	12.54	14.32	12.90	13.70	14.09	14.08	13.23	13.48	12.11
February	11.63	13.87	13.16	14.21	14.10	14.07	12.80	13.32	12.13
March	11.49	14.18	13.22	14.22	14.46	13.99	13.01	13.19	12.12
April	11.58	14.57	13.28	13.87	14.47	14.12	13.08	13.02	12.36
May	11.60	13.55	13.64	14.27	14.55	14.08	13.20	12.81	12.91
June	10.82	13.93	13.90	14.31	14.58	14.05	13.27	12.57	13.29
July	13.06	14.06	14.00	14.26	14.42	14.08	13.52	12.56	13.48
August	13.52	13.98	14.10	14.24	14.54	14.08	13.40	12.53	13.53
September	14.00	13.89	13.78	14.21	14.53	13.97	13.49	12.67	13.50
October	14.45	13.55	13.42	14.07	14.49	13.75	13.40	12.28	13.48
November	14.30	11.92	13.46	13.99	14.45	13.39	13.61	11.98	13.54
December	14.17	12.43	13.69	13.97	14.13	13.27	13.44	12.16	13.53
Average	12.76	13.60	13.55	14.11	14.40	13.91	13.29	12.71	13.00

Comparison of Net Service-Station Prices January 1, 1941, and January 1, 1942

Atlantic and New England States

	Jan. 1, 1941	Jan. 1, 1942
Baltimore, Md.	11.75	13.25
Boston, Mass	9.20	12.20
Burlington, Vt.	9.80	13.70
Dover, Del.	12.00	13.50
Hartford, Conn.	9.50	12.40
Newark, N. J.	10.50	13.00
New York, N. Y.	9.00	11.40
Philadelphia, Pa.	10.00	11.50
Portland, Me.	10.10	12.70
Providence, R. I.	10.00	12.30
Washington, D. C.	11.50	12.50
Average	10.32	12.59

Central

Chicago, Ill.	11.60	13.10
Cleveland, Ohio	11.00	12.50
Dallas, Tex.	9.50	11.00
Des Moines, Iowa	12.90	10.90
Detroit, Mich.	11.60	13.40
Duluth, Minn.	13.90	14.20
Fargo, N. D.	14.70	14.90
Huron, S. D.	14.00	14.30
Indianapolis, Ind.	12.80	13.20
Kansas City, Mo.	10.80	12.40
Little Rock, Ark.	12.00	13.25
Milwaukee, Wis.	13.30	14.60
Minneapolis, Minn.	12.70	12.90
Omaha, Neb.	12.90	12.40
Peoria, Ill.	12.20	13.20
Tulsa, Okla.	9.00	10.00
Wichita, Kans.	13.30	12.70
Average	12.13	12.87

Southeastern

	Jan. 1, 1941	Jan. 1, 1942
Atlanta, Ga.	11.50	15.00
Birmingham, Ala.	12.00	14.50
Charleston, S. C.	12.25	13.25
Charleston, W. Va.	13.05	14.50
Charlotte, N. C.	10.00	14.40
Jackson, Miss.	12.50	14.50
Jacksonville, Fla.	11.50	14.00
Louisville, Ky.	12.00	14.00
Memphis, Tenn.	12.50	12.25
New Orleans, La.	11.75	12.75
Norfolk, Va.	12.25	13.25
Average	11.94	13.85

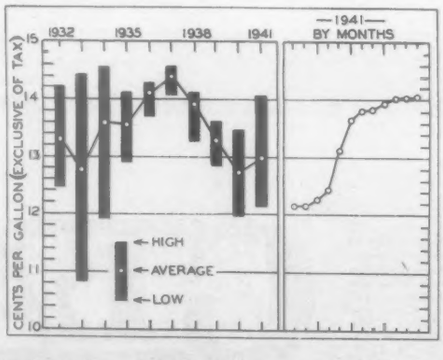
Midwestern

Albuquerque, N. M.	14.50	15.00
Boise, Idaho	16.00	17.50
Casper, Wyo.	15.00	15.50
Denver, Colo.	13.00	13.00
Helena, Mont.	13.00	14.50
Phoenix, Ariz.	15.00	16.00
Reno, Nev.	15.00	16.00
Salt Lake City, Utah	14.50	16.00
Average	14.50	15.44

Western Coast

Portland, Ore.	13.50	14.50
San Francisco, Calif.	13.00	14.00
Seattle, Wash.	13.50	14.50
Average	13.33	14.33

In the 50 cities composing The Oil and Gas Journal's list for selected price averages there were only 22 changes in quotations reported for the entire last 6 months of the year.



Retail gasoline prices started to recover in 1941 after consistent decline for previous 3 years

There were three outstandingly depressed marketing spots in the country at the start of this year. Tulsa, where motorists pay an average of 10 cents for gasoline; Des Moines, Iowa, where the year-end quotation was 10.9 cents and Dallas, Tex., where station operators retain only 11 cents were the notable weak spots. The average price of 11.4 cents in New York is only slightly better than the other three cities and Philadelphia, Pa., had an average service-station price of 11.5 cents at the start of 1942.

The drain on income of petroleum marketers for construction of new service stations or improvements and expansion of older outlets has been terminated by Conservation Order M-68-c which prohibits the acquisition of materials for this purpose with a few limited exceptions.

Petroleum marketers were attempting to appraise the results of federal regulations pertaining to their operations as the year opened but, as a general rule, no extensive changes had been made. Some anticipate that marginal outlets, the country-crossroads type of station will disappear, although, some argue, they have a definite strategic value in the movement of troops and equipment by overland routes. However, not many parts of the country have gaps between cities that

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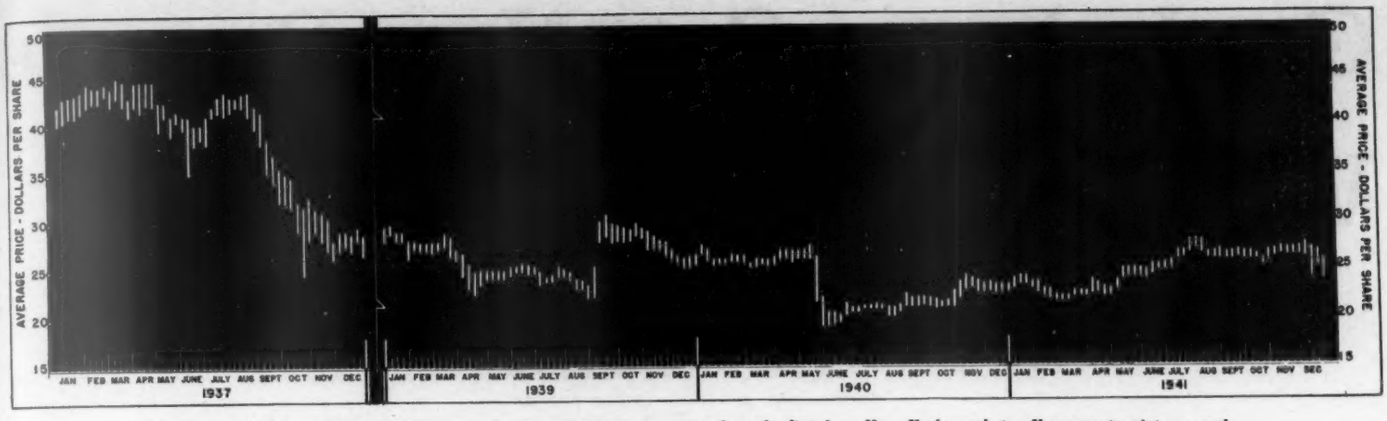
would require refueling at intermediate points. Advisability of maintaining marginal outlets has been a controversial point among marketing men for several years and it may be that circumstances of war will produce an answer to this debated issue.

The most significant change in normal marketing practices was the trend to a reduction in the service hours. Stations in the northeastern part of the country were the first to accept shorter hours, a change that eventually had the support of the Office of Petroleum Coordinator. After return of half the tankers used during the 1941 midyear months by the British, restrictions on the distribution of East Coast petroleum stocks were removed but most of the service stations in that part of the country retained the emergency policy of operating 12 hours daily, rather than 24 or 18 as in the past. Shorter service hours were adopted in other parts of the country as an operating economy.

Gasoline Service-Station Prices in Effect During 1941, Exclusive of Taxes, in 50 Representative Cities, With Price Changes and Dates

	Dealer margin	Price Jan. 1, 1941										Price Jan. 1, 1942	Tax Jan. 1, 1941	Tax Jan. 1, 1942
Albuquerque, N. M.	4.5	13.50	4/4 14.50	5/26 15.00	....	....	....	....	....	....	....	15.00	7.00	7.00
Atlanta, Ga.	4.0	11.50	3/24 13.00	4/7 13.50	4/17 13.00	5/12 14.00	6/6 14.25	7/16 14.50	11/3 15.00	....	....	15.00	7.50	7.50
Baltimore, Md.	4.0	11.75	1/20 12.25	4/25 12.75	5/19 13.25	....	....	....	....	....	....	13.25	5.50	5.50
Birmingham, Ala.	4.0	12.00	4/7 12.50	5/12 13.50	6/6 13.75	7/16 14.00	11/3 14.50	....	....	....	....	14.50	8.50	8.50
Boise, Idaho	4.0	16.00	4/7 17.00	5/26 17.50	....	....	....	....	....	....	....	17.50	6.50	6.50
Boston, Mass.	3.0	9.20	2/5 9.90	3/12 10.30	4/9 11.20	4/29 11.70	5/13 12.20	....	....	....	....	12.20	4.50	4.50
Burlington, Vt.	3.5	9.80	1/23 10.00	3/12 12.30	4/1 12.60	4/9 13.10	5/13 13.70	....	....	....	....	13.70	5.50	5.50
Casper, Wyo.	4.0	15.00	5/26 15.50	....	....	....	....	....	....	....	....	15.50	5.50	5.50
Charleston, S. C.	3.5	12.25	4/23 12.65	6/5 13.25	....	....	....	....	....	....	....	13.25	7.50	7.50
Charleston, W. Va.	3.5	13.05	4/25 13.55	5/19 14.55	....	....	....	....	....	....	....	14.55	6.50	6.50
Charlotte, N. C.	3.5	10.00	1/28 11.00	2/13 12.00	4/22 13.00	5/7 13.80	6/5 14.40	....	....	....	....	14.40	7.50	7.50
Chicago, Ill.	3.5	11.60	4/5 12.10	6/27 12.60	7/18 13.10	....	....	....	....	....	....	13.10	4.50	4.50
Cleveland, Ohio	2.0	11.00	4/2 11.50	5/6 12.00	5/29 12.50	....	....	....	....	....	....	12.50	5.50	5.50
Dallas, Tex.	3.5	9.50	2/21 8.50	3/17 10.00	6/12 11.00	....	....	....	....	....	....	11.00	5.50	5.50
Denver, Colo.	4.0	13.00	4/1 11.50	4/7 12.50	5/26 13.00	....	....	....	....	....	....	13.00	5.50	5.50
Des Moines, Iowa	3.5	12.90	4/5 13.40	5/8 12.40	7/11 11.90	9/12 10.90	....	....	....	....	....	10.90	4.50	4.50
Detroit, Mich.	3.5	11.60	4/5 12.10	4/17 12.60	6/9 13.40	....	....	....	....	....	....	13.40	4.50	4.50
Dover, Del.	3.5	12.00	4/12 12.50	5/9 13.00	5/21 13.50	....	....	....	....	....	....	13.50	5.50	5.50
Duluth, Minn.	3.5	13.90	4/5 14.40	5/26 14.90	5/29 14.40	6/11 14.20	....	....	....	....	....	14.20	4.50	5.50
Fargo, N. D.	3.5	14.70	4/5 15.20	5/26 15.70	6/11 14.90	....	....	....	....	....	....	14.90	5.50	5.50
Hartford, Conn.	2.5	9.50	3/12 11.00	4/9 11.50	5/13 12.40	....	....	....	....	....	....	12.40	4.50	4.50
Helena, Mont.	4.0	13.00	3/24 14.00	5/26 14.50	....	....	....	....	....	....	....	14.50	6.50	6.50
Huron, S. D.	3.5	14.00	4/5 14.50	6/11 14.30	....	....	....	....	....	....	....	14.30	5.50	5.50
Indianapolis, Ind.	3.5	12.80	4/5 13.30	5/10 12.40	5/26 12.90	5/29 13.20	....	....	....	....	....	13.20	5.50	5.50
Jackson, Miss.	4.0	12.50	1/1 11.50	2/12 11.00	2/15 10.50	3/11 9.50	3/27 12.50	4/7 13.00	6/6 13.25	7/16 13.50	8/28 14.00	11/3 14.50	14.50	7.50	7.50
Jacksonville, Fla.	4.0	11.50	3/24 12.00	4/7 12.50	5/12 13.00	6/6 13.25	7/16 13.50	11/3 14.00	....	....	....	....	14.00	8.50	8.50
Kansas City, Mo.	3.5	10.80	1/14 10.90	4/5 11.40	5/26 11.90	8/1 12.40	....	....	....	....	....	....	12.40	4.50	4.50
Little Rock, Ark.	4.0	12.00	4/8 12.75	4/26 13.25	....	....	....	....	....	....	....	....	13.25	8.00	8.00
Louisville, Ky.	3.5	12.00	4/7 12.50	5/12 13.00	6/6 13.25	7/16 13.50	11/3 14.00	....	....	....	....	....	14.00	6.50	6.50
Memphis, Tenn.	3.0	12.50	3/1 11.50	4/24 12.50	5/21 12.75	6/5 13.25	10/16 12.25	....	....	....	....	....	12.25	8.50	8.50
Milwaukee, Wis.	4.0	13.00	4/5 14.30	5/26 14.80	6/11 14.60	....	....	....	....	....	....	....	14.60	5.50	5.50
Minneapolis, Minn.	3.0	12.70	4/5 13.20	4/29 13.50	5/1 13.50	5/20 12.70	5/26 13.20	6/11 13.40	12/15 12.90	....	....	....	12.90	4.50	5.50
Newark, N. J.	3.7	10.50	3/4 10.80	4/10 11.40	4/25 12.40	5/20 13.00	....	....	....	....	....	....	13.00	4.50	4.50
New Orleans, La.	3.5	11.75	4/24 12.75	....	....	....	....	....	....	....	....	....	12.75	8.50	8.50
New York, N. Y.	2.0	9.00	2/5 9.20	3/6 9.50	4/2 9.90	4/23 10.20	5/9 11.00	5/28 11.40	....	....	....	....	11.40	5.50	5.50
Norfolk, Va.	3.5	12.50	5/19 13.25	....	....	....	....	....	....	....	....	....	13.25	6.50	6.50
Omaha, Neb.	3.5	12.90	4/5 13.40	4/17 11.90	5/3 10.40	5/26 10.90	6/17 11.40	7/31 12.40	....	....	....	....	12.40	6.50	6.50
Peoria, Ill.	3.5	12.20	4/5 12.70	5/26 13.20	8/5 13.70	9/17 12.70	11/28 13.20	....	....	....	....	....	13.20	4.50	4.50
Phoenix, Ariz.	4.0	15.00	4/24 15.50	5/23 16.00	....	....	....	....	....	....	....	....	16.00	6.50	6.50
Philadelphia, Pa.	2.0	10.00	4/12 10.50	5/9 11.00	5/21 11.50	....	....	....	....	....	....	....	11.50	5.50	5.50
Portland, Me.	3.1	10.10	1/14 10.50	1/23 9.40	2/5 8.10	2/13 10.30	3/12 11.30	4/2 11.60	4/9 12.10	5/2 12.40	5/13 12.70	....	12.70	5.50	5.50
Portland, Ore.	4.0	13.50	4/24 14.00	5/23 14.50	....	....	....	....	....	....	....	....	14.50	6.50	6.50
Providence, R. I.	3.0	10.00	1/23 10.20	2/5 10.40	2/26 10.20	3/12 10.90	4/9 11.70	5/13 12.30	....	....	....	....	12.30	4.50	4.50
Reno, Nev.	4.0	15.00	4/24 15.50	5/23 16.00	....	....	....	....	....	....	....	....	16.00	5.50	5.50
Salt Lake City, Utah.	4.0	14.50	4/7 15.50	5/26 16.00	....	....	....	....	....	....	....	....	16.00	5.50	6.50
San Francisco, Calif.	4.0	13.00	4/24 13.50	5/23 14.00	....	....	....	....	....	....	....	....	14.00	4.50	4.50
Seattle, Wash.	4.0	13.50	4/24 14.00	5/23 14.50	....	....	....	....	....	....	....	....	14.50	6.50	6.50
Tulsa, Okla.	2.0	9.00	5/26 10.00	....	....	....	....	....	....	....	....	....	10.00	5.50	7.00
Washington, D. C.	3.5	11.50	4/25 12.00	5/19 12.50	....	....	....	....	....	....	....	....	12.50	3.50	3.50
Wichita, Kans.	3.5	11.30	4/5 11.80	5/9 11.00	6/1 11.70	8/1 12.30	9/5 12.70	....	....	....	....	....	12.70	4.50	4.50
Average	3.5	12.14											13.53	5.86	5.95



Average of high and low quotations on 30 representative common oil stocks listed on New York markets. Uppermost point on each vertical line represents average of highs while the base represents average of lows. Data reflect market at close of each week

TRENDS in Market Value of Oil STOCKS

(Averages Compiled by Carl H. Pforzheimer & Co., Member of New York Stock Exchange and New York Curb Exchange)

1941	High	Low	Close	1941	High	Low	Close
January 4	24.09	22.97	23.77	July 5	25.68	24.77	25.36
January 11	24.41	23.49	24.02	July 12	26.80	25.45	26.56
January 18	24.27	23.22	23.45	July 19	26.86	26.01	26.48
January 25	23.75	22.97	23.52	July 26	27.86	26.52	27.38
February 1	23.70	22.56	22.68	August 2	27.88	26.98	27.30
February 8	23.06	22.39	22.88	August 9	27.60	26.40	26.53
February 15	22.90	21.84	21.94	August 16	26.65	25.92	26.14
February 22	22.31	21.75	22.07	August 23	26.58	25.93	26.20
March 1	22.35	21.82	22.04	August 30	26.99	25.84	26.41
March 8	22.38	21.73	22.14	September 6	26.51	25.76	25.94
March 15	22.74	22.05	22.45	September 13	26.59	25.79	26.39
March 22	22.87	22.21	22.72	September 20	26.84	26.09	26.32
March 29	22.76	22.14	22.49	September 27	26.58	25.54	25.95
April 5	23.92	22.48	23.69	October 4	26.56	25.82	26.24
April 12	23.56	22.43	22.52	October 11	26.32	25.49	25.84
April 19	22.95	22.15	22.45	October 18	25.96	25.06	25.47
April 26	23.19	22.22	22.81	October 25	26.75	25.41	26.62
May 3	23.92	22.71	23.82	November 1	26.86	26.09	26.54
May 10	25.22	23.82	24.84	November 8	27.12	26.39	26.86
May 17	25.09	24.18	24.53	November 15	26.98	26.14	26.50
May 24	25.37	24.27	24.70	November 22	26.97	26.18	26.77
May 31	24.92	24.15	24.35	November 29	27.17	26.10	26.69
June 7	24.80	23.85	24.46	December 6	27.46	25.94	27.07
June 14	25.35	24.37	25.12	December 13	26.82	23.76	25.65
June 21	25.31	24.67	24.88	December 20	26.45	24.91	25.18
June 28	25.53	24.73	25.08	December 27	25.61	23.68	24.04

Thirty companies whose common stocks make up the average values shown above: Amerada, Atlantic, Barnsdall, Consolidated, Continental, Creole, Gulf, Humble, Imperial, International, Mid-Continent, Ohio, Phillips, Plymouth, Pure Oil, Seaboard Oil, Shell Union, Skelly, Socony, South Penn, Standard of California, Standard of Indiana, Standard of Kentucky, Standard of New Jersey, Standard of Ohio, Texas Co., Texas Pacific Coal & Oil Co., Tide Water Associated, and Union Oil Co.

South American Countries Need Industry to Develop Resources

(Continued from Page 84)

startling confirmations of the foregoing statement regarding the purchasing power of local currencies for locally produced goods and services. Alongside this road is a textile mill. At lunch time, scores of the wage-earner type of workmen hired taxicabs to take them to restaurants and homes. In Lima, a standard haircut costs about 8 American cents; in Santiago, a so-called first-class (not first class according to present day American standards but comparable with what we had 3 or 4 decades ago) trolley ride costs 20 centavos or less than 0.8 cent; a second-class ride is half of that.

However, even the standard of living of the South American urbanite cannot be maintained entirely out of locally produced goods and services. Because of the very limited extent of manufacture, previously mentioned, the South American must resort extensively to importations for many of the goods desired. When buying imported commodities, he must pay prices which include the wages of foreign workers receiving relatively high monetary compensation. The wages of motormen reported above will serve as illustration. Or this principle could be illustrated quickly for the purpose by the case of the purchase of an American made automobile. An automobile of a certain modest type will cost the American motorman 4 or 5 months' wages. A similar automobile will cost the South American motorman 16 to 20 months' wages and in addition the wages of many other months are necessary in order to pay for import duties and other strictly South American charges. Consequently, the low money wages of South American workers result in a low standard of living, brought about in either or both of two ways: first, by confining purchases to local goods, there is obtained a maximum quantity of a generally lower quality of a very restricted range of merchandise; second, to the extent that part of purchasing power is expended on imported goods, the cost of which is relatively high, there is left a residual purchasing power so greatly curtailed as severely to limit purchases of locally produced articles. However, attention is called to the fact that a high protective tariff often makes the price of locally manufactured goods nearly as high as the price of imported goods.

No doubt with the extension of industrialization, the very high protective tariffs of the present will be reduced, bringing to the South American purchaser of local goods as great purchasing power for his money when buying manufactured goods as it now has when buying other local products like foodstuffs, flowers and personal services.

There is still another broad consideration necessary to an understanding of the subject of this note, i.e., the South American standard of living. It grows out of the climatic conditions experienced by a very large part of the 92-odd million people of the continent. Without resort to voluminous statistical descriptions of the effects of these climatic conditions on the costs of living, an adequate notion of the matter may be gained by a broad comparison of the effects of climate on living costs in South America, on corresponding costs in the southernmost part of the State of California and in other parts of the United States. It has been affirmed that to maintain a given standard of living in southern California, there is required an expenditure of not quite as much as 72 per cent of the expenditure required to maintain the same standard of living in a composite of all other parts of the United States. Just how South American costs of living would average out on this basis is unknown but the favorable influence of a warm, mostly dry climate upon the costs of housing construction, of house heating, of clothing including inclement weather apparel, etc., is evident in many places. No doubt, in the prosperous years ahead, the solution of the problem of air conditioning of buildings in the warmer parts of the South American continent will call for expenditures which will be an offset to those made in North America for air conditioning against cold weather. But by that time, North American air conditioning may have progressed so far as to maintain something like the existing gap between the two parts of the Western Hemisphere.

Gas Industry Sets New Records While Planning War Services

By J. P. O'DONNELL

Ample fuel to supply industries producing war materials is the outstanding requirement confronting the producers and transporters of natural gas over the next several months. The increase of 2,000 industrial consumers and the sharp gain in consumption by this class of users was also the outstanding development of 1941.

The most pressing demand on the gas industry is the construction of facilities from large reserves in the Southwest for transmission of fuel to the Appalachian manufacturing section. Gas reserves in the northeastern section of the country have been withdrawn at record rates during recent years. Exploration for gas in Pennsylvania, West Virginia, and other eastern states has failed to develop new reserves to offset the current rate of production.

NEW YORK, Jan. 27.—New records in production, consumption and revenue established while the industry was gearing itself to a vital role in the national-defense picture, made 1941 an outstanding year for the natural-gas industry. Preliminary figures prepared by the statistical department of the American Gas Association show that:

1. Production, including that used in the manufacture of carbon black and for field purposes, reached a total of approximately 3,000,000,000,000 cu. ft. This compared with an estimated 2,600,000,000,000 cu. ft. in 1940, an increase of more than 15 per cent.

2. Consumption in the utility field exclusively totaled 1,600,336,000,000 cu. ft. This compared with 1,441,692,000,000 cu. ft. in 1940, an increase of 11 per cent.

3. Revenue from domestic, commercial, industrial and electric generation sales was $522,053,000. This total compared with $492,717,000 in 1940, an increase of 6 per cent.

The most significant figure in these preliminary estimates is the industrial consumption. It rose from 716,668,000,000 cu. ft. in 1940 to 851,635,000,000 cu. ft., up 18.8 per cent from the previous high. This all-time record increase for this class of consumption is indicative of the role which natural gas is being called upon to perform in the national-defense program. The 134,967,000,000 cu. ft. increase in the industrial sales accounted for 85 per cent of the total gain in natural-gas sales last year.

Industrial Gain Is Feature

The industrial classification stood out both in the volume and proportion of its gain but there was also an appreciable increase in sales for the generation of electric power. The latter rose 20,562,000,000 cu. ft. to 203,510,000,000 cu. ft., an increase of 11.2 per cent. Commercial sales rose but 4.4 per cent to 127,975,000,000 cu. ft. while domestic sales, including house heating, dropped 0.6 per cent despite a 4.9 per cent increase in the number of customers indicating the mildness of the weather that prevailed through much of 1941.

Considerable significance is attached to the gain in number of consumers. Percentagewise, the increase was greatest in the number of domestic customers but the most significant gain was that in industrial users. The 49,000 industrial customers used an average of 17,380,306 cu. ft. in 1941 against an average of 55,150 cu. ft. per domestic customer. However, the high-service-cost domestic customer furnished the bulk of the gross revenue, since he paid an average of 67.3 cents per 1,000 cu. ft. against 17.4 cents for the industrial and electric-generation customer. Domestic customers contributed 53.8 per cent of the 1941 natural-gas revenue; industrial and electric generation, 35.2 per cent; and commercial, 11 per cent.

Centered in South and Southwest

Natural-gas pipe-line construction in 1941 was centered in the south and southwest where approximately 900 miles were added. At the end of the year a half dozen additional lines, aggregating more than 4,700 miles, were projected for 1942 and beyond. Because of the lack of steel it is considered probable that much of this proposed construction will be delayed. However, some projects are vital to the nation's war effort. For this reason it is believed that priorities will be granted that will make possible considerable construction this year. Included in this category is the proposed 772-mile line of the Hope Natural Gas Co. from Louisiana and Texas to West Virginia where it would connect with existing distribution facilities to serve the highly industrialized and heavy gas-consuming Pittsburgh-Youngstown-Cleveland area where a shortage is threatened and where rationing of available supplies is being considered. This area is now supplied entirely by the Appalachian area where reserves have been steadily declining under vastly increased consumption without compensating discoveries. Another line for which 1942 construction is in prospect is the 1,726-mile system proposed by the Tennessee Gas & Transmission Co., which would serve Central Tennessee and western North Carolina where several important industries are located.

Meeting Increased Demands

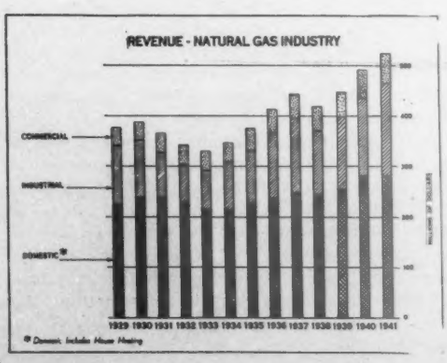
In order to meet the greater demands imposed on the industry by the war, all national-defense activities with respect to production, transmission and consumption have been coordinated in the Office of Petroleum Coordinator. This action was taken in the latter part of the year and T. R. Weymouth was appointed consultant on natural gas. Since then, five district committees covering the country have been set up in an organization largely paralleling that established earlier for the oil industry.

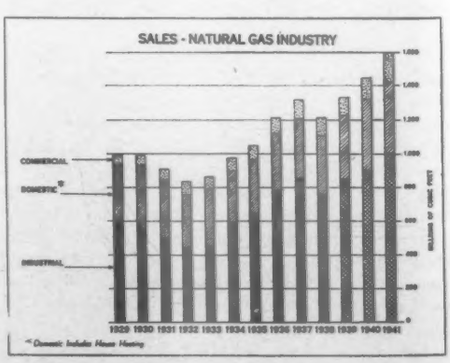
The technological progress of the industry continued in 1941. The new field opened by the liquefaction and regasification process was explored further and consideration was given to the transportation of liquefied natural gas. Other developments included those associated with distillate recovery and greater utilization of the chemicals found in natural gas. The manufacture of carbon black still represents by far the greatest nonutility use of natural gas but many other byproducts ranging from solvents to synthetic resins are available and are being manufactured. The chemical field is believed to represent a large potential market for natural gas which accounts for the new and increased emphasis being placed upon it.

PRELIMINARY ESTIMATES OF THE NATURAL-GAS INDUSTRY FOR 1941

Customers—	1941	1940	Per cent change
Domestic*	7,565,000	7,212,000	+4.9
Commercial	574,000	565,000	+1.6
Industrial	49,000	47,900	+4.3
Total	8,188,000	7,824,000	+4.7
Gas sales (M.c.f.)—			
Domestic*	417,216,000	419,532,000	—0.6
Commercial	127,975,000	122,544,000	+4.4
Industrial	851,635,000	716,668,000	+18.8
Elec. generation	203,510,000	182,948,000	+11.2
Total Ind. & Elec. generation	1,055,145,000	899,616,000	+17.3
Total	1,600,336,000	1,441,692,000	+11.0
Revenue (dollars)—			
Domestic*	$280,971,000	$283,017,000	—0.7
Commercial	57,083,000	55,923,000	+2.1
Ind. & Elec. generation	183,999,000	153,777,000	+19.7
Total	$522,053,000	$492,717,000	+6.0

*Including house heating.


REVENUE - NATURAL GAS INDUSTRY
COMMERCIAL
INDUSTRIAL
DOMESTIC*
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941
* Domestic Includes House Heating

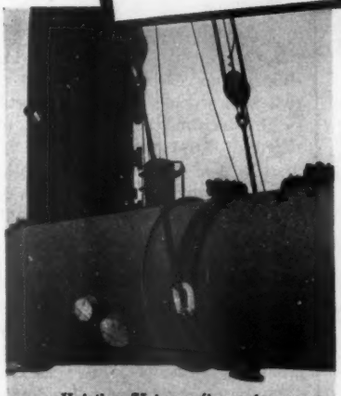

SALES - NATURAL GAS INDUSTRY
COMMERCIAL
DOMESTIC*
INDUSTRIAL
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941
* Domestic Includes House Heating

Easy to Answer!

▸▸ *Question:* What is the safe, quick, economical way to handle a load that is

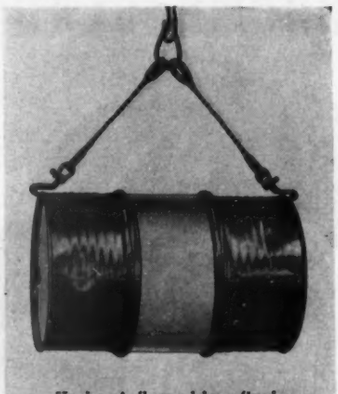
HEAVY... like a big refinery tower?
IRREGULAR... like a casting?
SLIPPERY... like a stack of pipe?
UNWIELDY... like a drum or barrel?

See Answer Below



Hoisting 75-ton refinery tower with non-slip plaited sling.

Slick, sliding pipes can be easily balanced and stacked.



Hooks grip flanged drum firmly; other fittings for odd shapes.

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* MURRAY PATENTS: U. S., 1475859, 1524671; CANADA, 252874, 258068

Tanker Construction at Highest Level Attained Since First War

NEW YORK, Jan. 26.—Completion of 28 tankers last year made 1941 the best year from a construction standpoint since the boom of the first World War, which carried over from 1918 into 1921, when more than 200 ocean-going tankers were built in United States shipyards. In completing the 28 vessels, domestic shipyards slightly exceeded expectations. Early in 1941 it was estimated that 27 would be completed during that year. (See The Oil and Gas Journal, Feb. 27, 1941, p. 39.)

Tankers completed last year aggregated 434,039 deadweight tons, an average of 15,500 tons each. They were 50 per cent larger than the average tanker of the 1918-21 period, several knots faster and have from 50 to 100 per cent greater carrying capacity.

Construction last year attained a post-depression peak as Table 1 and Fig. 1 show. A list of 1941 completions is given in Table 2. As substantial as last year's building program was it will be dwarfed by the number scheduled for completion in 1942 which will be from two to three times greater and 1943 will witness an even further gain. While the current United States tanker-building program is about the same as that of the first World War period from a numerical standpoint it actually is substantially larger on account of the larger size and faster speeds of today's vessels. It is probable also that the construction schedule as of January 1, 1942, will be considerably expanded. A list of tankers contracted for or under construction as of January 1 in United States shipyards is given in Table 3. This table and other data given in this report were obtained from the Bulletin of the American Bureau of Shipping.

No official figures on tanker losses resulting from the war are available but it is estimated that they total 1,500,000 deadweight tons, including Axis vessels, up to January 1, 1942. Therefore, despite the fact that United States construction was still far below the pace it will reach in 1942 and 1943 it was sufficient to supply enough vessels in 1 year to offset 30 per cent of the losses in 2¼ years of warfare. Since the outbreak of the war in September 1939, there have been 46 tankships completed in this country aggregating more than 700,000 deadweight tons, equal to 46 per cent of war losses so far. The losses for the first 27 months of the war represent about 10 per cent numerically of the world's prewar tanker fleet.

Tankers constitute the most important type of single-cargo vessels in the world. As of January 1, 1941, the world's merchant fleet, according to a U. S. Maritime report subject to revision, consisted of 8,885 vessels of which 1,535 or more than 17 per cent were tankers. The total gross tonnage of the world's fleet was 50,317,361 tons of which 10,995,569 tons were tankers or 22 per cent. The importance of tankers was even more pronounced in the United States merchant fleet which, as of September 30, 1941, consisted of 1,114 vessels of which 353 or 32 per cent were tankers.

About 50 per cent of the United States tankers are in the 6,000 to 8,000 gross-ton class while the greatest number of cargo vessels are in the 5,000-6,000 ton class. Tankers also dominated the larger classifications accounting for 72 per cent of the vessels in the 8,000 to 10,000-ton group and 76 per cent of those in the 10,000 to 12,000-ton class.

From the standpoint of speed the bulk of United States tankers are average. Approximately 57 per cent are in the 10 to 11-knot class, half that number were rated in the 11 to 14 group and about 6 per cent from 14 to 17 knots. The average age of the United States ocean-going tankers as of October 1, 1941, was 17.3 years and, except for the passenger-ship group which averaged 17.2 years,

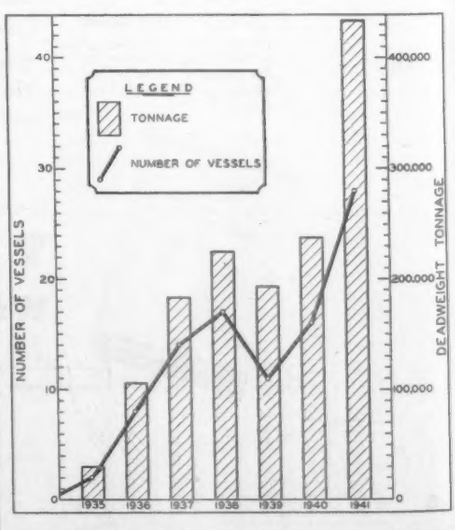

Fig. 1—Trend of tanker construction for past 8 years

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GENERAL AMERICAN TANK STORAGE TERMINALS

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CARTERET, NEW JERSEY (Port of New York)
CORPUS CHRISTI, TEXAS GALENA PARK, TEXAS (Port of Houston)

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was the oldest of any classification in the merchant fleet.

As of June 30, 1941, the American tanker fleet consisted of 358 vessels. At that time it was employed as follows: 58 in nearby foreign service (Canada, Mexico, Central American, West Indies and north coast of South America to and including the Guianas) service, 12 in overseas service, 286 in coastwise service and 2 were laid up. This status would represent the normal employment of the tanker fleet. Since then a large number were transferred to British shuttle service, some of which have been returned, and 40 have been transferred from the Atlantic to the Pacific. The present disposition of the fleet cannot be revealed but it is obviously far from normal.

In addition to the more than 350 tankers under United States registry, American companies and their affiliates had 201 tankers of 2,138,533 deadweight tons under foreign registry as of September 30, 1941. These included the 39 tankers which had been transferred to foreign registry up to July 1, 1941. Twenty-eight of the latter are now sailing under the Panamanian flag.

TABLE 1—U. S. TANKER CONSTRUCTION 1932-1941

Year—	No.	Tonnage (deadweight)
1941	28	434,039
1940	16	238,352
1939	11	193,112
1938	17	225,950
1937	14	182,700
1936	8	105,130
1935	2	29,760
1934-32	0	0
Ten-year total	96	1,409,043

TABLE 2—1941 U. S. TANKERS COMPLETED

Name and owner—	Gross tons
January	
Esso Little Rock, Standard Oil (N. J.)	11,237
March	
Pan Rhode Island, Pan American P. & T.	7,730
Petrol, National Bulk Carriers	7,306
Atlantic Sun, Sun Oil Co.	11,355
Virginia, National Bulk Carriers	10,731
April	
E. H. Blum, Atlantic Ref. Co.	11,615
Stanvac Calcutta, Petroleum Shipping	10,169
May	
Esso Williamsburg, Standard Oil (N. J.)	11,237
June	
Stanvac Cape Town, Petroleum Shipping	10,169
Albert E. Watts, Sinclair Ref. Co.	10,907
Stanvac Melbourne, Petroleum Shipping	10,012
July	
Wm. C. McTarnahan, National Bulk Carriers	7,306
Stanvac Palembang, Petroleum Shipping	10,013
August	
Sinclair Opaline, Sinclair Ref. Co.	7,874
Paul M. Gregg, Union Oil Co.	8,187
W. C. Yeager, Atlantic Ref. Co.	11,615
Corsicana, Socony-Vacuum Oil Co.	9,890
Stanvac Manila, Petroleum Shipping	10,169
Stanvac Wellington, Petroleum Shipping	10,013
October	
Sinclair Rubilene, Sinclair Ref. Co.	7,874
Caddo, Socony-Vacuum Oil Co.	9,890
November	
Sinclair Superflame, Sinclair Ref. Co.	7,874
Patrick J. Hurley, Sinclair Ref. Co.	10,864
Charles S. Jones, Richfield Oil Corp.	8,111
Victoria, C. A. de N. M.	7,416
Esso Albany, Standard Oil (N. J.)	10,097
December	
A. C. Rubel, Union Oil Co.	8,187
Esso Trenton, Standard Oil Co. (N. J.)	10,097

TABLE 3—TANKERS BUILDING OR ORDERED JANUARY 1, 1942

(American Bureau of Shipping Bulletin)

Owner—	No.	Gross tons
Maritime Commission	153	1,511,650
Sinclair Ref. Co.	5	49,600
Socony-Vacuum Oil Co.	6	58,800
Union Oil Co.	3	27,600
Panama Transport	8	88,000
Continental Oil Co.	1	8,000
Gulf Refining Corp.	4	35,200
Standard Oil (N. J.)	3	29,800
Texas Co.	6	57,600
Keystone Tankship	2	20,000
Sun Oil Co.	3	34,200
Atlantic Ref. Co.	3	28,100
Standard Oil (Calif.)	2	22,800
National Bulk Carriers	2	18,900
Reinauer	1	160
Total	202	1,990,410

TABLE 4—U. S. TANKER CLASSIFICATIONS

Class (gross tons)—	No.	Gross tonnage*
2,000-3,000	5	12,945
3,000-4,000	5	17,599
4,500-5,000	15	69,795
5,000-6,000	36	192,224
6,000-8,000	174	1,217,254
8,000-10,000	86	760,134
10,000-15,000	32	358,893
Total	353	2,628,844

*Approximately two-thirds deadweight tonnage.

WILCOX TREND AND JACKSON COUNTY PLAYS YIELD GOOD RESULTS

By NEIL WILLIAMS

HOUSTON, Tex.—While drilling operations along the Texas Gulf Coast district during 1941 showed a slight decline from the previous year, the search for new reserves was highly successful as 20 new fields were found and important extensions and new sands enlarged the potentiality of numerous proven fields. Highlighting the year's development was the widespread exploration along the Wilcox trend which opened six new fields, and the Frio play in Jackson County where successive strikes, new sand and extensions to proven fields provided the district with its most active area.

As exploration along the Wilcox trend progresses it becomes more evident that this immense area has just been scratched and it is reasonable to predict that the majority of future reserves will be furnished by this type of development. Since the discovery of the Joe's Lake field in Tyler County in 1937, the discovery curve of this area began to rise and the past year can be classified as its most successful year as new pools were opened in Tyler, Lavaca, Wharton and Montgomery counties.

Although development of these new fields are in the early stages and their potentiality cannot be accurately measured, the discoveries are highly significant in view of the fact that they have placed additional light on the trend which is having considerable bearing on future exploration. Prior to the past year it was assumed that production from the Wilcox was limited to an updip depth of approximately 6,000 ft., and a downdip depth of about 9,000 ft. This theory was discounted shortly after the first of the year with the opening of a new deep sand in the Sheridan field, Colorado County, at a depth of 9,200 ft., about 1,100 ft. below the original pay in the upper Wilcox at 8,100 ft. Prior to the opening of this deep sand wildcats drilled along the trend were generally abandoned after drilling from 500 to 600 ft. below the Wilcox section.

As a result of the above discovery operators began to drill deeper into the section, and at the

(Continued on Page 115)

DISCOVERIES IN TEXAS GULF COAST DURING 1941

Pool, county, company, and farm name—	Survey	Date of comp.	Producing formation	Producing depth	Initial production	No. producing wells Jan. 1, 1942
Brushy Creek, Lavaca, Shell, 1 McManus					453 bbl., 132 bbl. salt water,	
Chenango, Brazoria, J. N. Rayzor, 1 J. W. Christian	William Parker	1-27	Frio	8,556-73	¼-in. choke	2
Clodine, Fort Bend, Providence Oil, 1 Hatfield	H. D. Brown	6-19	Yegua	7,499-7,502	108 bbl., 9/64-in. choke	7
Fostoria, Montgomery, Atlantic, 1 Foster Lbr. Co.	P. Gill	12-7	Cockfield	5,790-94	218 bbl., ¼-in. choke	1
Fred, Tyler, Stanolind, 1 J. F. Parker	T. W. Collins	11-4	Wilcox	8,180-8,200	119 bbl. oil, 47 bbl. salt	
Goodrich, Polk, Pan American, 1 Texas Long Leaf Lbr. Co.	A. Viesca	11-25	Cockfield	4,037-54	water, ¼-in. choke	2
Lake Creek, Montgomery, Superior Oil Calif., 1 McWhorter	T. J. Nichols	3-10	Wilcox	9,212-17	170 bbl., 47/64-in. choke	3
Lissie, Wharton, Crosby Drilling Co., 1 Poole	A. Fry	12-12	Wilcox	9,655-81	218 bbl., 7/32-in. choke	1
Lucky, Matagorda, Stanolind, 1 L. F. Huehner	E. Hall	3-3	Frio	8,883-86	75 bbl., ¾-in. choke	2
Needville, Fort Bend, W. L. Goldston, 1 E. M. Coyle	H.&T.C.	11-29	Frio	5,176-80	Gas distillate	1
Magnolia, Montgomery, Glenn H. McCarthy, 1 Sayle	J. Scott	10-25	Wilcox	8,448-58	87 bbl., ¼-in. choke	1
Maurbro, Jackson, Humble, 1-B Mauritz	B. J. White	2-13	Frio	5,220-30	167 bbl., 8 hr., ¾-in. choke	31
Navidad, Jackson, Boyle & Mayo, 1 Terrell	William Murphy	3-10	Frio	3,786-93	Gas well	1
North La Ward, Jackson, Moor & Ahern, 1 Burdett	I.&G.N. No. 3	9-29	Frio	5,207-26	122 bbl., ¼-in. choke	15
Oyster Bayou, Chambers, Sun, 3 Jackson	T.&N.O. 126	4-25	Frio	8,250-80	666 bbl., ¼-in. choke	6
Sabine Pass, Jefferson, British American, 2-71 State	71	3-27	Miocene	4,982-92	291 bbl., 12/64-in. choke	1
Vienna, Lavaca, M. McMurray, 1 A. C. Allen	M. Muldoon	6-17	Wilcox	8,468-71	45 bbl. dist., 5/32-in. and ⅛-in. choke	1
West Silsbee, Hardin, Republic Prod., 1 Elliott	Elliott	4-15	Cockfield	6,917-23	43 bbl., ⅛-in. choke	2

PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Conroe	11,747,119	32,184	1,043,399	941,382	921,021	925,546	1,014,495	1,000,534	910,669	958,407	903,178	994,117	1,024,468	1,110,203
Hastings	7,816,688	21,416	575,770	520,539	626,400	616,880	679,556	706,228	618,604	649,340	617,967	680,870	771,210	753,324
Old Ocean	4,882,632	13,377	339,415	320,869	310,925	383,263	419,147	408,243	395,527	439,590	421,303	462,317	475,920	509,113
Anahuac	4,667,182	12,787	291,400	265,213	318,905	386,791	427,113	372,746	393,193	417,025	398,127	441,295	450,570	504,804
Thompson	4,616,615	12,648	317,554	289,147	369,495	373,077	412,036	403,860	379,191	398,125	380,205	418,530	427,569	447,826
West Ranch	3,689,781	10,109	200,754	192,622	251,252	265,209	309,352	306,000	305,387	334,869	330,179	375,879	389,579	428,699
Withers-Magnet	3,527,163	9,663	216,691	200,635	289,719	205,399	341,115	335,427	315,231	331,588	283,767	345,525	272,520	389,546
Tomball	3,323,907	9,107	208,950	187,533	263,677	270,897	298,009	293,340	272,006	291,763	278,487	303,312	307,648	348,285
Barbers Hill	3,138,792	8,599	249,017	219,130	233,414	232,128	238,107	277,859	267,322	271,242	258,834	274,169	298,652	318,918
Friendswood	2,993,044	8,200	174,968	158,809	221,844	250,326	277,591	270,064	251,922	264,678	252,163	278,506	284,250	307,923
Fairbanks	2,899,429	7,944	188,567	171,581	232,759	239,833	261,968	258,212	237,868	249,723	239,727	261,798	270,612	286,781
West Columbia	2,767,181	7,581	223,032	215,100	225,651	217,842	229,744	233,103	236,299	238,886	232,396	240,440	234,137	240,551
Hull	2,437,509	6,678	187,223	162,161	179,762	175,220	190,619	156,812	205,805	215,241	207,650	213,092	264,149	279,775
Dickinson Gillock	2,000,660	5,481	161,113	148,114	144,756	146,628	159,819	184,020	163,021	170,350	161,286	178,292	182,040	201,221
Manvel	1,943,827	5,326	163,412	147,640	163,474	153,952	168,341	165,961	152,218	158,781	151,957	161,584	170,910	185,597
Hardin	1,640,575	4,495	101,652	94,121	133,530	139,389	152,904	148,918	135,088	142,311	132,882	144,604	152,519	162,657
Segno	1,536,366	4,209	138,430	125,717	125,516	114,860	127,501	128,910	118,911	126,621	111,782	133,504	136,620	147,994
Lolita	1,438,070	3,940	63,377	64,831	81,675	91,024	111,210	112,440	121,426	137,842	139,279	161,577	166,860	186,527
Lovells Lake	1,344,484	3,684	117,762	108,052	106,824	99,747	112,741	112,650	97,041	103,900	101,982	121,356	125,130	137,299
Raccoon Bend	1,334,270	3,656	101,417	91,628	110,228	108,385	118,350	114,902	109,287	113,566	108,501	118,182	120,210	120,124
Amelia	1,241,092	3,400	89,287	80,991	97,444	94,782	104,271	113,912	102,003	107,149	101,110	110,232	115,229	124,682
High Island	993,057	2,721	84,836	77,629	85,278	82,213	84,567	82,380	85,110	84,495	70,658	86,097	84,782	85,312
Humble	967,099	2,650	70,604	62,280	73,310	71,642	76,558	89,730	72,965	81,657	79,610	81,563	100,755	106,415
Esperson	945,269	2,590	73,781	66,123	73,838	69,844	74,878	76,470	80,059	81,711	78,845	86,332	85,738	97,650
Joe's Lake-Spurger	821,727	2,525	86,504	78,756	76,429	67,779	77,392	73,769	70,602	74,011	71,451	78,999	79,018	87,017
Orange	879,583	2,410	80,234	73,441	74,715	70,952	78,861	73,498	85,603	68,929	63,764	72,507	70,943	66,136
West Beaumont	816,568	2,237	110,266	83,664	78,457	62,957	64,796	62,613	57,261	58,002	57,947	61,160	58,468	60,977
South Houston	796,772	2,183	73,395	66,214	66,705	59,795	66,315	67,324	60,578	63,726	60,788	67,521	69,329	75,082
Bay City (Van Vleck)	790,613	2,166	64,997	59,774	59,826	59,192	65,840	64,497	62,007	65,689	64,027	70,637	74,612	79,515
Picketts Ridge-Kubela	783,424	2,146	57,712	50,558	61,754	62,582	67,099	66,570	65,390	69,742	66,468	70,407	69,812	75,330
Cotton Lake and S.	774,467	2,122	70,495	66,644	67,144	58,413	64,024	75,871	57,915	58,443	54,235	61,590	65,913	73,780
Lochridge	741,187	2,031	67,944	61,519	62,820	60,822	62,529	63,479	59,995	61,130	56,491	56,910	62,887	64,661
Silsbee	700,515	1,919	46,635	42,477	58,131	61,499	62,266	62,519	62,906	60,774	59,013	61,185	61,048	62,062
Pierce Junction	658,622	1,804	52,260	45,756	46,040	50,050	53,222	57,810	52,250	55,640	51,748	57,389	63,813	72,664
Hamman	653,827	1,791	53,282	47,263	49,760	46,394	53,961	66,929	47,835	52,160	54,080	48,661	63,597	69,905
Sugarland	646,327	1,771	79,191	71,652	57,051	45,901	50,492	48,150	45,900	48,197	45,902	50,488	50,548	52,855
League City	627,982	1,720	51,400	47,920	50,213	48,175	52,030	52,528	47,961	52,311	50,166	55,910	57,089	62,279
Eureka Heights	597,527	1,637	66,404	61,697	57,478	51,577	52,315	53,612	41,109	41,897	41,314	43,597	42,569	43,958
Clear Creek	585,399	1,605	33,975	30,990	46,847	49,432	53,744	55,126	48,445	50,760	49,212	52,791	54,840	59,117
Livingston	576,102	1,578	49,759	44,551	50,634	47,889	48,276	49,078	48,227	48,114	46,635	48,028	46,737	48,174
Nome	567,695	1,555	45,194	40,824	47,510	46,037	49,902	50,429	43,832	46,359	44,521	48,413	50,279	54,405
Goose Creek	524,638	1,437	44,412	39,999	43,978	41,370	42,788	52,186	41,462	46,342	37,167	40,323	48,452	46,159
Turtle Bay	497,575	1,363	35,501	31,822	39,769	39,394	42,699	42,180	40,601	43,281	40,332	43,385	51,212	47,399
Spindletop	487,780	1,336	43,229	38,864	41,520	38,654	40,826	40,927	38,363	39,943	37,427	40,482	41,459	46,066
Cordele	485,981	1,331	37,040	35,533	39,094	38,680	40,093	39,928	42,546	43,292	41,354	43,116	41,879	43,156
Fannett	448,441	1,229	27,014	29,699	30,612	32,103	37,098	36,629	36,274	41,099	38,641	42,756	46,079	50,437
Louise	432,498	1,185	33,849	32,731	33,788	35,265	37,146	38,582	33,948	36,272	35,897	36,461	37,949	40,610
Port Neches	407,335	1,116	29,984	27,872	31,328	30,244	33,918	33,452	31,759	36,246	36,276	38,893	42,296	35,067
Sour Lake	399,680	1,095	30,428	27,778	32,562	31,751	33,664	36,359	33,528	32,453	32,422	31,749	36,962	40,114
Boling	389,613	1,067	33,849	32,731	33,788	35,265	37,146	38,582	33,948	36,272	35,897	36,461	37,949	40,610
Blue Ridge	334,738	917	27,465	24,177	23,819	22,103	26,206	24,934	27,713	27,963	28,246	35,092	32,579	34,441
Dyersdale	313,889	860	28,111	20,966	14,679	18,170	18,036	19,259	22,063	26,338	30,409	34,611	37,382	43,685
Maurbro	192,843	528			4,306	5,332	8,135	8,518	16,177	21,402	24,679	30,177	32,608	41,509
North Markham	189,528	519	5,359	5,867	7,884	8,880	12,273	12,898	15,183	17,816	20,002	25,397	25,739	32,240

★

RESULTS Count

B and W, Inc.

WALL CLEANING GUIDES

Have been used for cementing casing in these fields:

TEXAS GULF COAST

Withers	Anahuac
Vanderbilt	Amelia
West Ranch	Segno
Lolita	Galveston Bay
LaWard	Lovell's Lake
North Markham	Clodine
Katy	League City
Bessie Heights	Dickinson
Fairbanks	West Columbia
Magnet	Maubro
Tomball	North Thompson

LOUISIANA GULF COAST

North Crowley	Chalkley
Gueydan	Iowa
Porte Barre	Erath
Ville Platte	Saint Gabriel
Hackberry	Jennings

SOUTHWEST TEXAS

Sullivan City	Greta
McFaddin	Colorado
Fagan	Placedo
Keeran Ranch	Plymouth
Midway	Minnie Boch
North Clara Driscoll	Freer
Hoffman	Boyle
Flour Bluff	

OTHER TEXAS FIELDS

East Texas Field	Crane
Chapel Hill	Denver City
K.M.A.	Aspermont
Slaughter Pool	

And 37 other Texas fields in which only one company is operating.

WEST COAST

West Montebello	Kettleman Hills
Rosecrans	Rincon
Rio Bravo	Midway Sunset
Domingues	Wilmington
Ventura Ave.	L. B. Harbor
Signal Hill	Santa Maria
Del Valle	Coalinga N. E.
Huntington Beach	Coyote Hills

. . . and others

OTHER FIELDS

ILLINOIS:	INDIANA:
Roland	Griffin
Brownsville	MISSISSIPPI:
Dale	Tinsley
Albion	

This wide usage PROVES the successful performance of B and W Guides in removing mud cake, centering casing, prevention of channeling and increasing percentage of successful completions.

SEND FOR BULLETIN 102

BRUCE BARKIS — **B and W, Inc.** — KENNETH WRIGHT

Well Completion Specialists

Makers of

B and W Wall Cleaning Guides

Gulf Coast & Foreign Distributors of

NELSON Pre-Packed Gravel LINERS

WILLIS ROTARY CHOKES

WEST COAST

3545 CEDAR AVENUE

LONG BEACH, CALIFORNIA

TELEPHONE: LONG BEACH 4-8366

GULF COAST

1105 COMMERCE BUILDING

HOUSTON, TEXAS

TELEPHONE: PRESTON 9783

★

TEXAS GULF COAST PRODUCTION, 1937-1941

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Austin County:								
Raccoon Bend	2,021,582	1,207,058	1,029,931	1,229,446	1,334,270	169	164	160
Brazoria County:								
Angleton	.....	.....	12,726	246,808	242,773	.....	8	9
Chenango	.....	.....	.....	.....	36,378	.....	.....	2
Chocolate Bayou	.....	.....	1,741	38,322	122,241	.....	1	5
Damon Mound	141,625	113,149	99,552	102,974	89,185	32	36	29
Danbury	5,098	116,839	163,564	105,872	144,735	1	11	15
Hastings	5,717,164	6,996,128	6,516,721	5,500,282	7,816,688	122	685	685
Lochridge	252,264	563,246	831,722	804,378	741,187	2	44	42
Manvel	3,458,697	3,310,952	2,684,722	2,616,509	1,943,827	133	178	182
Old Ocean	449,053	1,679,438	3,213,257	4,150,434	4,882,632	3	76	110
Rowan	.....	.....	.....	25,609	145,272	.....	7	8
Sandy Point	51,448	120,364	46,275	18,797	36,379	.....	1	4
West Columbia	848,441	1,634,823	2,274,772	2,319,574	2,767,181	32	127	154
Total	10,923,790	14,534,939	15,845,052	15,930,718	18,968,471	325	1,174	1,245
Chambers County:								
Anahuac	4,352,378	2,830,645	2,551,755	2,679,491	4,667,182	143	339	366
Barbers Hill	4,469,771	3,477,611	3,180,276	3,286,608	3,138,792	162	163	169
Cedar Point	.....	95,252	254,527	413,715	270,362	.....	17	17
Cotton Lake and S.	372,646	540,594	600,907	707,197	774,467	6	59	57
Lost Lake	52,609	44,471	47,284	31,520	23,392	8	8	8
Red Fish Reef	.....	.....	.....	3,886	153,185	.....	1	14
Seabreeze	32,755	137,415	101,041	107,552	120,876	1	11	14
Turtle Bay	331,913	399,182	357,919	263,589	497,575	7	36	38
Willow Slough	.....	92,464	127,933	95,508	86,338	.....	10	12
Fig Ridge	.....	.....	.....	10,250	37,605	.....	1	8
Fishers Reef	.....	.....	.....	851	27,238	.....	1	2
Oyster Bayou	.....	.....	.....	.....	40,113	.....	.....	6
Total	9,612,072	7,617,643	7,221,642	7,600,067	9,807,125	327	646	711
Colorado County:								
Garwood and W.	.....	.....	.....	461	43,833	.....	1	5
Sheridan	.....	.....	.....	28,161	47,574	.....	3	4
Total	.....	.....	.....	29,622	91,407	.....	4	9
Fort Bend County:								
Big Creek	377,017	225,720	174,786	135,234	141,498	24	27	24
Blue Ridge	356,051	248,382	270,617	274,024	334,738	52	49	57
Orchard	182,428	167,897	145,486	110,327	51,477	14	15	18
Rosenberg	.....	.....	7,998	10,825	6,582	.....	2	2
Sugarland	1,331,713	1,219,570	1,192,911	1,350,424	646,327	52	51	51
Thompson	4,108,386	3,969,053	4,436,083	4,338,727	4,616,615	204	331	356
Clodine	.....	.....	.....	.....	31,844	.....	.....	7
Total	6,355,595	5,830,560	6,227,881	6,219,651	5,829,081	346	475	515
Galveston County:								
Alta Loma	.....	.....	.....	13,188	63,189	.....	2	4
Caplen	.....	.....	40,284	107,147	165,444	.....	10	16
Dickinson-Gillock	1,794,844	2,611,131	3,712,556	2,986,977	2,000,660	53	214	225
Greens Lake	10,553	6,654	4,873	18,561	34,588	1	5	2
High Island	1,204,758	789,300	825,890	956,154	993,057	53	62	62
Hitchcock	18,419	178,590	334,017	201,313	154,606	.....	13	13
League City	.....	4,988	376,421	725,051	627,982	.....	27	31
Total	3,028,574	3,590,663	5,294,041	5,008,391	4,039,526	107	333	353
Hardin County:								
Ariola	215,658	187,491	84,363	122,106	167,898	13	9	11
Batson	651,010	620,391	596,797	460,127	343,421	202	208	217
Saratoga	177,669	319,585	334,486	306,955	281,210	222	247	257
Silsbee	442,804	616,096	501,960	373,196	700,515	2	47	42
Sour Lake	574,709	447,083	394,749	414,858	399,680	185	140	152
West Silsbee	.....	.....	.....	.....	21,483	.....	.....	2
Total	2,061,850	2,190,646	1,912,353	1,677,242	1,914,207	624	651	681
Harris County:								
Aldine	.....	.....	9,643	15,648	13,257	.....	1	1
Bammel	6,362	18,129	83,515	251,873	43,233	.....	15	16
Clear Lake	.....	39,824	132,906	370,103	585,394	.....	56	59
Clinton	5,779	102,655	82,663	46,700	46,955	1	8	7
Dyersdale	.....	.....	.....	39,050	313,889	.....	9	36
Eureka Heights	16,800	259,366	1,038,705	915,132	597,527	1	40	37
Fairbanks	.....	803,404	2,585,600	2,434,661	2,899,429	.....	282	295
Friendswood	95,325	1,073,965	2,255,614	2,533,629	2,993,044	.....	212	210
Goose Creek	864,514	581,085	677,105	603,034	524,638	82	88	93
Humble	1,273,419	1,263,028	1,043,676	1,044,999	967,099	257	258	279
Joyce Richardson (Ogburn)	.....	.....	.....	10,276	26,515	.....	3	5
Mykawa	706,492	493,415	398,799	382,174	269,354	40	28	30
Pierce Junction	1,229,190	1,158,077	928,612	670,668	658,622	76	73	79
Satsuma	139,645	125,137	105,551	119,070	91,345	3	12	12
South Houston	1,944,199	1,175,729	945,527	637,933	796,772	73	95	96
Tomball	3,034,048	2,588,478	2,485,431	2,511,155	3,323,907	248	437	481
Total	9,315,584	9,682,292	11,773,347	12,585,805	14,105,980	781	1,617	1,736
Houston County:								
Kittrell	350,292	226,824	172,481	116,623	138,875	13	16	16
Jackson County:								
Cordele	.....	113,539	655,054	733,097	485,981	.....	44	45
Edna	798	2,181	1,065	1,079	474	1	6	6
Francitas	.....	2,231	62,587	92,782	100,673	.....	8	8
Ganado	14,704	11,859	10,292	2,551	137,682	.....	1	21
Lolita	.....	.....	.....	178,950	1,438,070	.....	57	169
Maurbro	.....	.....	.....	.....	192,843	.....	.....	31
Mauritz	48,867	51,897	43,996	190,440	104,119	1	8	8
Texana	.....	.....	1,167	7,291	11,735	.....	2	3
West Ganado	.....	.....	.....	74,217	85,681	.....	12	26
West Ranch (Vanderbilt)	27,898	17,346	228,763	1,778,555	3,689,781	1	221	366
North La Ward	.....	.....	.....	.....	21,329	.....	.....	15
Total	92,067	199,053	1,002,924	3,058,962	6,268,368	3	359	698
Jefferson County:								
Amelia	1,486,605	1,895,975	928,363	887,192	1,241,092	16	114	112
Clam Lake	2,072	36,580	50,135	88,170	136,428	.....	13	14
Fannett	314,290	202,827	146,610	177,300	448,441	19	34	50
La Belle	14,811	224,685	157,738	19,652	63,742	.....	6	10
Lovells Lake	.....	48,293	239,087	872,104	1,344,484	.....	69	82
Nome	580,252	508,917	387,666	316,637	567,695	7	43	43
Sabine Pass	.....	.....	.....	.....	10,938	.....	.....	1
South China	.....	.....	15,182	107,600	178,344	.....	16	18
Spindletop	874,941	784,915	715,579	573,369	487,780	142	145	145
West Beaumont	.....	532,634	984,188	1,117,626	816,568	.....	57	63
Total	3,272,971	4,234,826	3,624,584	4,518,275	5,295,512	184	497	538
Liberty County:								
Cleveland	214,963	143,233	107,327	70,269	86,869	7	10	10
Esperson	615,466	489,540	498,139	791,424	945,269	40	61	82
Hankamer	577,221	448,329	358,987	259,108	236,968	35	34	34
Hardin	132,728	1,649,458	2,164,422	1,638,949	1,640,575	1	158	161
Hull	2,535,820	2,883,636	2,258,046	2,110,242	2,437,509	179	181	205
North Dayton	44,387	37,274	27,439	19,164	7,302	7	8	9
Martha	.....	.....	24,365	85,665	159,764	.....	7	12
Scuth Liberty	218,003	182,038	138,122	191,108	161,967	51	41	44
Total	4,338,588	5,833,508	5,568,847	5,165,929	5,676,223	320	500	557

(Continued on Page 115)

end of the year prolific production was coming from the Wilcox sand at depths of 10,000 to 11,000 ft. with the limits of production still undetermined. This discovery led to deeper drilling in proven Wilcox fields such as Segno, Polk County; Joe's Lake, Tyler County, and the Eola field in Avoyelles Parish. While no production was found, sufficient showings were obtained to cement casing for testing.

As the year closed all indications pointed to a more widespread development for the trend as more attention was being paid to the updip sector extending through Grimes, Houston, Trinity, Walker and San Augustine counties. This particular area has been neglected in so far as any large-scale development is concerned, but is due for considerable exploration as the result of the successful development of the middle Wilcox in Central Louisiana which is on the same strike.

Jackson County continued to furnish important new reserves and maintained its status as the most active drilling area in the district by continued development in the West Ranch and Lolita fields. The play has been devoted to the Marginulina-Frio sands which is found in the majority of the fields from 4,600-5,200 ft. The first important discovery of the year was the Maurbro field opened by the completion of Humble 1-B Mauritz which found production at 5,220-33 ft. Located on a block of several thousand acres, development for the first few months was confined to the company's holdings. However, as development extended to the south and southeast additional drilling was started by other companies and independent operators and 31 wells have now been completed with the structure not fully defined.

Approximately 2½ miles due west and located in the I.&G.N. Survey 3, Moore & Ahern 1 A. Burdett was completed in the Frio sand at 5,207-26 ft. as the discovery well of the North La Ward field which quickly assumed major importance by a 1½-mile southwest extension. The sand in the extension test was encountered practically flat with the discovery well. Due to the diversified ownership of the area the field is receiving a rapid development program. At the end of the year the structure had been fairly well outlined to the southwest and southeast by structurally low wells, but some 3,000 acres were considered proven and much drilling remains to be done befor the limits are defined.

As the result of new sand discoveries in the Ganado and West Ganado fields, Jackson County, these structures which at first appeared to be of minor importance now represent important reserves. The new sand at Ganado was opened by Texas 1 Stillman, 1,000 ft. west of the discovery well, originally completed as a small producer in the discovery pay at 5,000-5,100 ft. The new pay was found at 6,468-82 ft., and the well was completed for an initial production of 355 bbl. daily through a ¼-in. choke. Additional development has shown that the new sand blankets the entire structure and several of the wells completed in the discovery sand have been killed and deepened to the new pay.

Multiple sands in the West Ganado field were opened by Pure Oil Co. at 4,600-4,700 ft. and at 5,995-6,005 ft. These sands were found on the west and southwest sides and have been found to be of blanket nature. Main production is from the 4,600-4,700-ft. horizon.

There were four other Frio sand fields opened, two of which appear to be important strikes. These include the Oyster Bayou field in Chambers County where a thick sand section in the basal Frio has extended production over a wide area with the limits of the field still undefined, and the Stowell field in Jefferson County which is producing from the basal Frio sand below 8,800 ft. Only the discovery well has been drilled on the structure but all indications points to a field of considerable size. Other Frio sand fields include Chenango, Brazoria County, and Lucky in Matagorda County. Development in these fields has been disappointing.

Cockfield sand production was opened in the Garwood area, Colorado County, by W. R. Davis Co. at 6,104-8 ft. The new production was opened about 2,700 ft. northeast of Wilcox distillate production, opened shortly after the first of the year. The sand was found to be uniform and several producers were completed in the sand before development was halted during the last 4 months of the year.

Other fields in which important extensions are new sands were opened at Chocolate Bayou and Danbury fields, Brazoria County; Fig Ridge, Chambers County; Clodine, Fort Bend County, and the Hull field in Liberty County.

PRODUCTION, 1937-1941

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Matagorda County:								
Armour	.....	.....	.....	34,041	30,431	.....	4	4
Bay City (Van Vleck)	817,667	759,527	944,611	825,355	790,613	20	44	52
Blessing	.....	.....	.....	510	28,859	.....	1	7
Buckeye-Wilson Creek	73,346	74,966	56,630	81,056	63,991	2	5	5
Buttermilk Slough	.....	.....	2,851	4,420	2,729	.....	1	1
Markham	646,054	576,361	579,734	354,159	272,678	33	48	56
North Markham	.....	17,066	30,422	34,493	189,528	.....	4	20
Palacios	33,987	77,549	24,918	11,990	5,547	.....	3	3
West Hamman (Lucky)	.....	.....	.....	.....	15,500	.....	.....	2
Haman	152,786	552,049	761,258	1,151,919	653,827	7	24	31
Total	1,723,840	2,057,518*	2,400,424	2,497,943	2,053,703	62	134	181
Montgomery County:								
Conroe	15,157,548	11,580,239	9,199,357	9,303,006	11,747,419	936	935	936
Lake Creek	.....	.....	.....	.....	47,361	.....	.....	3
Total	15,157,548	11,580,239	9,199,357	9,303,006	11,820,771	936	935	941
Orange County:								
Orange	243,544	468,365	902,539	892,078	879,583	46	39	89
Port Neches	444,486	426,476	324,050	317,449	407,335	18	19	42
Total	688,030	894,841	1,226,589	1,209,527	1,286,918	64	58	131
Polk County:								
Ace	52,551	22,484	67,659	141,367	75,467	2	8	5
Livingston	991,902	693,894	555,777	609,580	576,102	88	86	86
Segno	438,837	686,163	908,294	1,555,060	1,536,366	1	103	121
Total	1,483,290	1,402,541	1,531,730	2,305,907	2,187,935	91	197	212
Tyler County:								
Joe's Lake-Spurger	70,477	277,811	406,851	827,145	921,727	.....	44	47
Washington County:								
Brenham	10,888	10,023	10,006	9,899	4,389	29	24	20
Clay Creek	310,059	194,278	169,507	134,418	154,260	51	54	54
Total	320,947	204,301	179,513	144,317	158,629	80	78	74
Waller County:								
Brookshire	2,613	1,837	1,372	225	777	1	1	1
Katy	.....	6,055	74,801	75,961	55,958	.....	10	11
Total	2,613	7,892	76,173	76,186	56,735	1	11	12
Wharton County:								
Abel	.....	.....	.....	13,599	26,441	.....	1	1
Boling	548,345	564,552	567,960	468,407	389,613	71	93	95
East Bernard	.....	.....	.....	716	684	.....	1	1
Louise	615,923	471,878	462,464	352,715	432,498	34	41	41
Picketts Ridge-Kubela	722,750	587,464	574,341	622,547	783,424	33	45	69
Hillje	.....	.....	1,370	71,157	233,197	.....	14	18
Withers-Magnet	680,703	328,992	1,638,884	2,193,304	3,527,163	17	287	357
Total	2,567,721	1,952,886	3,245,022	3,725,779	5,393,020	155	482	582
Gulf Coast total*	73,570,507	73,842,673	78,032,601	82,925,440	97,361,949	6,727	8,376	9,405
Daily average	201,563	202,308	213,788	226,572	266,745	.....	.....	.....

*Includes abandoned fields. Miscellaneous fields included in the above totals are: West Conroe, 6,807 bbl.; Magnolia, 1,184 bbl.; Shepherd, 4,138 bbl.; Rockland, 2,868 bbl.; Fred, 4,712 bbl.; East Bernard, 684 bbl.; Vienna, 248 bbl.; Brushy Creek, 1,500 bbl.

Summary of Wells Completed During 1941

Field—	Comp.	Oil	Prod.	Gas	Dry
Alta Loma	3	2	750	0	1
Anahuac	26	23	11,473	1	2
Angleton	1	1	188	0	0
Boling	2	2	992	0	0
Batson	4	4	129	0	0
Blue Ridge	9	5	705	0	4
Blessing	8	6	960	0	2
Barbers Hill	5	5	1,570	0	0
Big Creek	2	2	96	0	0
Buckeye	2	0	0	0	2
Brushy Creek	1	1	124	0	0
Chocolate Bayou	3	3	673	0	0
Caplen	5	4	856	1	0
Conroe	1	1	422	0	0
Chenango	6	2	603	0	4
Clear Lake	1	1	443	0	0
Clodine	6	5	1,196	0	1
Clam Lake	1	1	124	0	0
Cordele	4	4	651	0	0
Danbury	2	2	515	0	0
Dyersdale	38	31	8,418	3	4
Dickinson	5	4	1,172	1	0
Esperson	18	15	4,617	1	2
Fannett	20	16	8,619	1	3
Fairbanks	7	7	859	0	0
Fishers Reef	2	1	168	0	1
Fig Ridge	7	6	4,317	0	1
Ganado	15	15	2,483	0	0
Garwood	7	5	1,180	0	2
Greens Lake	2	1	108	0	1
Goodrich	2	2	198	0	0
Hastings	4	3	1,515	0	1
Hardin	8	7	1,392	0	1
High Island	2	1	160	0	1
Hillje	10	3	194	4	3
Humble	9	8	755	0	1
Hamman	2	1	177	0	1
Hull	19	15	3,869	1	3
Joe's Lake	5	2	528	1	2
Katy	1	1	121	0	0
La Belle	3	2	469	0	1
Lake Creek	2	2	451	0	0
League City	8	5	1,171	0	3
Lolita	115	113	22,135	0	2
Lovells Lake	20	19	2,387	0	1
Lochridge	3	2	445	0	1
Lucky	4	2	119	0	2
Magnet	16	15	1,621	0	1
Magnolia	1	1	87	0	0
Maurbro	31	31	10,643	0	0
Manvel	4	4	1,083	0	0
Markham	8	6	1,308	0	2
Martha	5	4	262	0	1
North La Ward	16	15	2,443	0	1
North Markham	15	15	2,756	0	0
Navidad	3	0	0	2	1
Old Ocean	33	32	11,210	0	1
Orange	3	3	402	0	0
Oyster Bayou	5	5	3,665	0	0
Pickett Ridge	5	3	175	1	1
Port Neches	11	11	1,421	0	0
Pierce Junction	5	5	1,378	0	0
Red Fish Reef	17	14	2,185	1	2
Rowan	3	2	212	0	1
Saratoga	2	1	72	0	1
Silsbee-West	2	2	351	0	0
Sheridan	1	1	144	0	0
Seabreeze	3	2	721	0	1
Segno	14	13	2,478	0	1
South China	4	3	439	0	1
Spanish Camp	2	0	0	2	0
Spurger	2	0	0	1	1
Sour Lake	6	4	441	0	2
Stowell	1	1	483	0	0
Sabine Pass	3	1	291	0	2
Texana	2	1	178	0	1
Tomball	24	18	4,935	3	3
Thompson	13	11	1,524	0	2
Turtle Bay	2	2	197	0	0
Van Vleck	8	8	1,482	0	0
Vienna	1	1	45	0	0
West Beaumont	4	3	304	1	0
West Ranch	141	133	32,269	4	4
West Columbia	30	26	8,537	0	4
Withers	53	50	5,562	1	2
West Ganado	28	24	2,691	1	2
Miscellaneous	122	0	0	4	118
Total 1941	1,078	833	194,486	36	209

Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	75	58	6	11	573,940
February	97	77	2	18	626,209
March	98	69	6	23	644,043
April	88	69	3	16	583,527
May	85	68	3	14	569,075
June	94	74	1	19	591,184
July	80	66	0	14	530,403
August	101	74	3	26	631,674
September	92	65	5	22	581,622
October	96	69	1	26	601,372
November	97	77	5	15	600,976
December	73	67	1	6	446,102
Total	1,078	833	36	209	6,980,127

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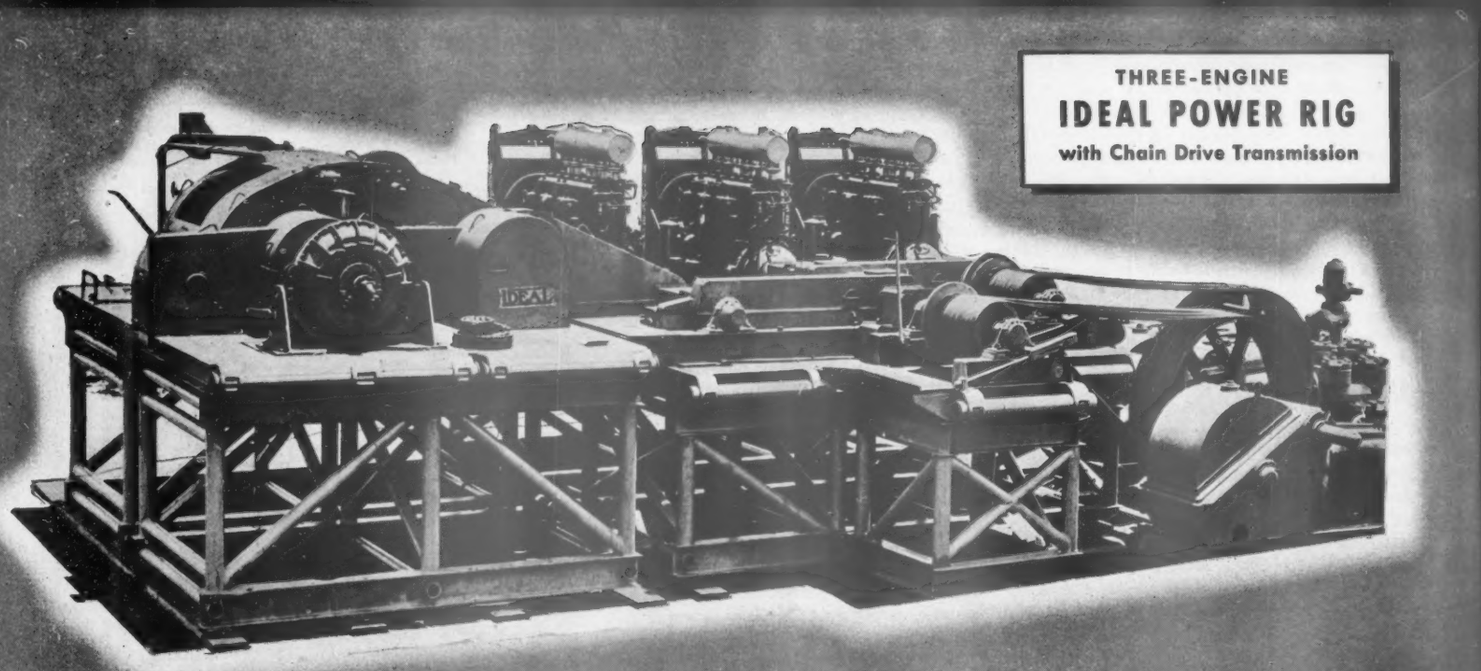

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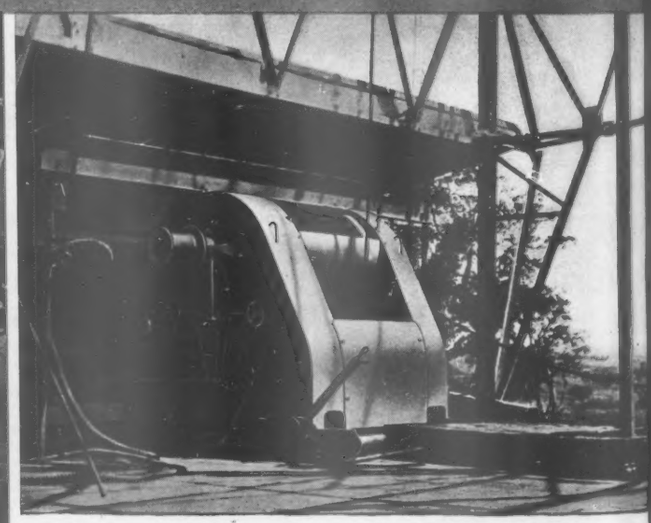

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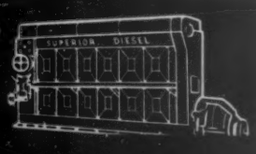

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Type 40	4,000	4½"	150 H. P.	4	4
Type 50	5,000	4½"	350 H. P.	6	3
Type 75	7,000	4½"	500 H. P.	6	3
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NORTHERN SAN JOAQUIN VALLEY TO GOVERN 1942 PROSPECTING

By L. P. STOCKMAN

IN conformity with the production plan for District 5 and in view of the shortage of critical materials, development work in California during 1942 will probably be reduced but because of the necessity of maintaining reserves and producing sufficient crude oil to meet requirements, wildcat exploration will be greatly stimulated and many wells that have been shut in for several years may be opened up again. Resumption of production in these suspended wells will require considerable pumping equipment as in most cases the wells were reduced to skeleton form and the equipment moved to other areas. It is believed quite probable that many of these idle wells will be returned to production, if pumping equipment is available, because of the demand for heavy fuel oil and the probability that early in the new year the production committee for District 5 will formulate plans for selective production whereby fields producing the quality of crude oil currently required will be given higher allowables and fields producing less favorable crude will be cut down. Many of the wells that have been shut in produce heavy crude oil that is eminently suited for fuel oil and since fuel oil is in strong demand it is logical to assume the production committee will produce the type of crude oil required. Transportation problems will undoubtedly influence production during 1942, especially in those areas that rely upon marine transportation to reach refining centers.

Wildcat exploration which will be aggressively pursued in California during 1942 will not be located in any particular section but on the contrary will be spread out over a wide area and possibly include some districts that have heretofore not been regarded with too much favor. This will be due to the necessity of maintaining or increasing reserves of crude oil and natural gas and may possibly also reflect increased exploration work in order to be able to charge off losses against excess taxes.

It has been the policy of California prospectors for many years to search for new fields along well-defined lines of folding either visible or evidenced by the location and trend of producing fields. The Beverly-Newport shear zone in Los Angeles Basin, the extensive Ventura Avenue anticline which extends westward from Ventura Avenue in the Coastal district to the ocean and along which has been found several fields, the Bear Mountain shear zone and the Mount Poso and Round Mountain faults along the eastern rim of the San Joaquin Basin in Kern County are outstanding examples of structural trends with commercial accumulations and in which several fields were found after the initial discovery. Because of

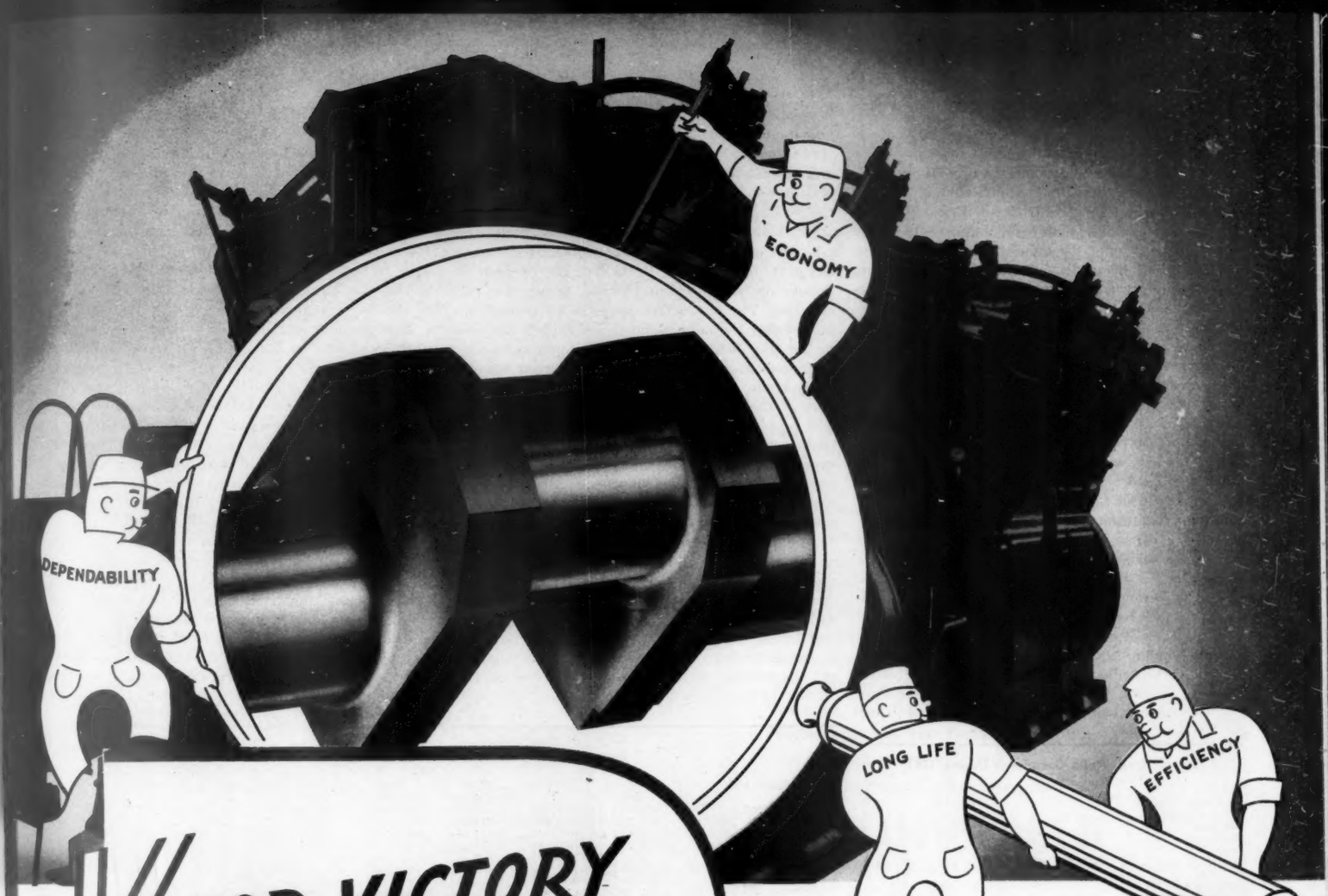
CALIFORNIA DISCOVERIES YEAR 1941

Pool, county, company and farm name—	Survey S.T.R.	Date of Comp.	Producing formation	Producing depth	Initial production	No. wells prod. 12-31-41
Dyer Creek, Kern, Shell, 56-X-11 Smith	11-26s-27e	9-16	Miocene	2,343-61	Pump 215 bbl.	1
Heim, Fresno, Amerada, 31-34 Clover	34-16s-17e	10-31	Miocene	7,300-10	Flow 662 bbl.	1
			Miocene	7,448-65	Flow 432 bbl.	
			Eocene	7,980-8,005	Flow 72 bbl.	
Jacalitos, Fresno, Wilshire-Annex, 33-26-A Jacalitos	26-21s-15e	10-12	Miocene	3,875-3,905	Pump 128 bbl.	1
Oak Canyon, Los Angeles, Western Gulf, 1 Lechler	31-5n-17w	2-1	Miocene	2,296-2,442	Pump 100 bbl.	3
Oak Canyon, Los Angeles, Western Gulf, 1 Wickham	31-5n-17w	12-3	Miocene	7,272-88	Flow 780 bbl.	
Panoche, Fresno, Jergins Oil Co., 1 Chency	29-14s-13e	1-19	Cretaceous	7,200-77	Flow 125 bbl.	1 shut in
Raisin City, Fresno, Shell, 8-18 Properties, Inc.	18-15s-18e	6-2	Miocene	5,005-45	Flow 24 bbl.	
Raisin City, Fresno, Seaboard, 77-13 Joint	13-15s-17e	11-20	Miocene	5,119-30 5,096-5,102	Flow 235 bbl.	3
Shafter, Kern, Continental, 2-C Kern County Land	35-27s-24e	9-26	Miocene	12,801-07	Flow 488 bbl.	1
Turnbull Canyon, Los Angeles, Continental, 1 Turnbull Comm.	13-2s-11w	10-18	Miocene	3,373-3,447	Pump 225 bbl	1
Union Avenue, Kern, Hancock Oil Co., 1 Roberts	6-30s-28e	2-1	Pliocene	4,237-92	Flow 250 bbl.	3
			Miocene	5,275-5,315	Pump 100 bbl.	
Riverdale, Fresno, Amerada, 45-26 Lawton	25-17s-19e	12-15	Miocene	6,665-85	Flow 558 bbl.	1

PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

CALIFORNIA

San Joaquin Valley	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Midway-Sunset	17,468,113	47,858	1,480,970	1,341,287	1,467,720	1,400,356	1,419,566	1,399,973	1,509,566	1,524,907	1,464,725	1,495,682	1,450,955	1,512,366
Coalinga	14,222,443	38,966	1,043,763	942,645	1,071,744	1,045,024	1,145,594	1,101,282	1,299,850	1,361,289	1,321,674	1,291,884	1,282,488	1,315,206
Kettleman N. Dome	13,986,676	38,319	1,217,592	1,093,942	1,203,142	1,161,451	1,192,474	1,152,327	1,181,968	1,189,954	1,158,985	1,195,787	1,160,068	1,078,986
Ten Section	5,236,827	14,347	368,715	360,520	394,755	405,862	433,835	428,233	454,481	468,258	459,222	494,890	475,218	492,838
Rio Bravo	4,530,713	12,413	342,152	322,440	359,885	357,006	378,700	371,098	387,694	406,187	392,568	409,497	395,185	408,301
Kern River	4,321,745	11,840	309,455	304,526	325,406	321,598	336,094	332,596	355,725	369,002	384,206	417,948	425,702	439,487
Mount Poso	4,117,028	11,280	277,716	255,713	275,473	275,690	300,593	313,478	356,666	408,493	393,905	418,524	411,768	429,009
Tupman	3,521,675	9,648	223,933	216,579	244,802	231,410	343,841	555,512	326,495	265,525	279,387	280,297	272,414	281,480
Elk Hills	3,491,517	9,566	372,354	336,594	370,072	358,380	369,873	354,017	300,839	198,991	207,393	216,942	202,082	203,980
Belridge, North	3,425,267	9,384	322,945	276,924	302,762	299,012	299,750	287,970	315,172	320,815	312,896	255,464	215,518	216,039
Round Mountain	2,815,204	7,713	233,717	206,529	235,497	225,329	230,096	220,169	253,216	254,645	238,673	248,152	233,023	236,158
Greeley	2,476,498	6,785	163,398	151,373	180,159	183,051	189,602	205,455	212,565	226,897	222,402	247,135	241,532	252,929
Coles Levee	2,194,600	6,013	156,602	147,050	164,870	182,180	192,550	167,748	186,123	200,989	187,424	205,667	196,006	207,390
Fruitvale	2,079,669	5,698	163,032	151,198	160,163	161,207	168,118	165,761	178,243	190,313	188,099	196,578	182,489	174,468
Mountain View	1,904,722	5,218	174,738	155,813	167,054	160,948	165,074	158,242	166,755	157,377	156,475	151,228	143,148	147,870
Canal	1,815,938	4,975	160,481	141,557	157,390	152,182	154,647	150,190	153,839	157,073	151,847	155,005	149,419	132,308
McKittrick	1,421,349	3,894	108,762	101,203	111,180	114,724	114,686	109,144	127,808	128,435	120,381	124,844	124,836	135,346
Lost Hills	1,262,502	3,459	102,178	91,095	104,835	101,894	110,018	105,488	108,325	107,598	103,514	109,458	106,406	111,693
Edison	1,017,430	2,787	82,679	78,482	85,586	83,332	94,263	92,971	94,636	91,083	77,198	76,875	76,377	83,948
Belridge, South	757,418	2,075	66,965	59,150	64,209	60,429	64,052	60,018	62,936	66,222	63,302	64,054	63,089	62,992
Wasco	632,709	1,734	49,354	50,621	55,392	52,388	53,794	52,858	53,526	53,967	52,916	53,993	53,316	51,584
Strand	547,531	1,500	43,130	37,896	41,188	40,849	45,972	44,955	43,828	48,523	46,295	55,401	50,824	48,670
Coastal district—														
Ventura Avenue	12,882,126	35,294	1,046,545	946,119	1,048,713	1,017,501	1,060,563	1,029,161	1,091,288	1,135,393	1,115,192	1,168,361	1,123,464	1,098,826
Santa Maria Valley	6,925,423	18,974	627,248	564,054	564,789	539,339	560,799	539,658	563,939	572,445	566,936	629,136	613,536	583,544
Ventura-Newhall	4,284,912	11,740	335,913	314,151	345,399	335,082	346,538	330,011	348,031	367,085	359,079	394,656	400,525	408,442
Santa Maria	3,185,729	8,728	179,421	125,420	191,251	238,483	291,570	294,191	344,191	283,615	276,630	376,797	304,571	279,589
Rincon	1,572,969	4,310	148,967	130,202	127,824	129,161	136,217	127,302	134,657	132,570	124,583	131,415	122,196	127,875
San Miguelito	1,400,198	3,836	114,832	106,924	118,007	113,851	123,622	120,119	122,703	127,668	121,620	127,587	125,300	77,965
Elwood	1,162,696	3,185	98,679	87,373	99,487	96,466	99,422	102,321	102,763	99,363	91,414	99,753	91,818	93,837
Capitan	741,222	2,031	54,021	48,394	55,446	50,524	59,402	67,485	72,650	73,953	68,996	71,057	67,586	51,708
Los Angeles Basin—														
Wilmington	30,682,198	84,061	2,525,701	2,308,149	2,554,037	2,457,549	2,557,575	2,490,567	2,544,578	2,641,951	2,596,468	2,705,057	2,628,273	2,672,293
Long Beach	14,712,021	40,307	1,295,140	1,182,740	1,296,024	1,264,688	1,285,338	1,238,754	1,199,772	1,212,650	1,172,393	1,191,229	1,165,378	1,207,915
Huntington Beach	10,755,232	29,466	825,506	763,943	838,751	856,799	906,695	942,876	965,598	1,003,666	982,785	929,385	852,566	886,662
Santa Fe Springs	8,559,187	23,450	752,881	679,326	743,279	706,803	728,453	701,666	720,895	723,082	704,304	710,471	688,047	699,980
Dominguez	8,505,983	23,304	624,679	599,579	671,584	670,028	727,474	815,122	825,591	697,654	692,329	738,633	716,887	726,423
Montebello	4,894,900	13,411	476,486	413,430	462,030	435,554	438,382	420,758	391,636	383,873	365,070	384,046	361,028	362,607
Inglewood	4,893,103	13,406	345,482	326,228	364,621	353,186	386,734	372,954	432,743	440,973	443,800	473,190	484,844	468,348
Rosecrans	3,472,792	9,515	366,189	311,641	324,104	297,997	297,605	275,238	275,672	268,672	251,496	258,690	258,924	286,564
Torrance	3,204,795	8,780	285,026	259,770	271,681	262,558	270,657	268,771	267,397	259,719	268,523	271,713	255,697	263,383
Coyote, West	3,075,304	8,425	269,071	238,607	270,376	236,467	228,144	238,649	273,042	284,152	222,070	277,034	265,140	272,552
Richfield	2,702,518	7,404	229,232	203,058	218,801	208,936	217,016	213,858	217,400	221,482	212,788	256,792	260,611	242,544
Seal Beach	2,401,743	6,580	202,528	178,800	197,242	198,780	200,201	198,869	201,913	211,467	203,120	213,454	209,772	185,597
Brea Olinda	2,077,442	5,692	172,656	155,374	176,499	172,372	173,869	166,659	179,330	177,843	170,690	181,118	172,596	178,436
Coyote, East	1,387,372	3,801	115,692	100,410	112,984	112,677	113,829	111,907	121,590	120,324	117,172	120,747	118,303	121,737
Playa Del Rey	1,317,957	3,611	120,521	103,239	116,853	109,409	115,225	105,022	108,221	110,500	109,414	110,914	103,084	105,555
Potrero	710,707	1,947	67,946	61,092	72,031	70,775	71,548	57,723	56,383	53,418	51,790	54,109	47,113	46,779
El Segundo	528,043	1,447	49,468	43,097	46,325	45,115	44,965	44,244	44,352	44,323	40,457	41,507	42,030	42,160
Whittier	169,786	465	6,463	6,235	6,638	6,462	5,726	5,591	6,698	6,960	27,799	30,677	29,444	31,093



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the urgency of the present situation it is quite likely that prospectors will move into new areas and at least into special districts where seismograph recordings and formations are favorable.

When the Jergins Oil Co. completed its discovery well in the Panoche district of Fresno County in the San Joaquin Valley on January 19, 1941, the industry was of the opinion that another new oil field had been discovered in California but this opinion was not sustained. The company worked on this wildcat for a long time endeavoring to develop commercial production of a normal crude oil without much success and the significance and importance of the Panoche district is at present conjectural. The discovery well, Jergins 1 Cheney, 29-14s-13e, was completed in the Cretaceous at 7,200-77 ft. flowing considerable gas and about 150 bbl. of high-gravity condensate per day. This may indicate the possible existence of a distillate field. The real significance of the Panoche wildcat is a possible revision of present opinions regarding the production possibilities of the Cretaceous. Formations of Cretaceous age have only been productive in a small way in California but a study of the Cretaceous has been under way for several months to determine its capacity to produce under favorable conditions.

A number of wells have drilled into the Cretaceous during the past few years and during 1941 several drilled into rocks of this age with negative results. These wildcats were carried into the Cretaceous because no producion had been developed in younger formations. Under those circumstances there is no reason why the Cretaceous should produce if the overlying Pliocene, Miocene and Eocene were barren. These wells, therefore, should not be considered as conclusive tests of Cretaceous possibilities. The Cretaceous has yielded a number of commercial gas fields in the central part of the state and especially in the district adjacent to the San Francisco Bay region in Solano, Sacramento, San Joaquin, Sutter and Yolo counties. The productive zones in all these fields is probably the equivalent of the Emigh gas zone in the Rio Vista gas field of Sacramento County.

Undoubtedly there will be a concerted attempt to find new commercial gas fields in the central part of the state during 1942 and some wildcats will probably also be drilled in search of oil in that area. Exploratory work in search of oil is expected to be broader in scope than heretofore and wildcat mortality will probably be somewhat higher than usual. Shell Oil Co., Inc., when it discovered the Raisin City field of Fresno County last June exploded the old bugbear about there being no oil north of Coalinga and this completion has therefore opened up considerable potentially productive territory north of the old deadline. The importance of the discovery of crude-oil production in the Raisin City field is clearly indicated by the discovery of the Helm field on October 31 and the finding of the Riverdale oil field on December 15 by Amerada Petroleum Corp. All three of these fields are north of Coalinga. Their importance from a production standpoint has not been determined due to the limited amount of drilling undertaken to date. Irrespective of this, however, the discovery of fields in this region should greatly stimulate exploratory work because it opens up a vast amount of acreage that heretofore has received little attention. It is not necessary to say that leasing activities in this section of the state have greatly increased since discovery of the Raisin City field.

The probable extension of wildcat exploration northward will be watched with considerable interest because of the large amount of Cretaceous rocks and any outstanding success will be followed by the greatest influx of prospectors ever witnessed. The Cretaceous in Central California was considered of such great importance that an entire day was devoted to the subject at the meeting of the Pacific section of the A.A.P.G. held in Los Angeles, October 16-17, 1941. The scope of papers presented at that meeting ranged from a list showing distribution of the various Cretaceous units in the state to a discussion of Cretaceous deposits in specific districts.

The possible importance of the California Cretaceous is obvious in view of the large area covered, although not all sections of the Cretaceous may be productive. The California industry must first determine which of the Cretaceous units offers the best possibilities from a production stand-

Summary of Wells Completed During 1941

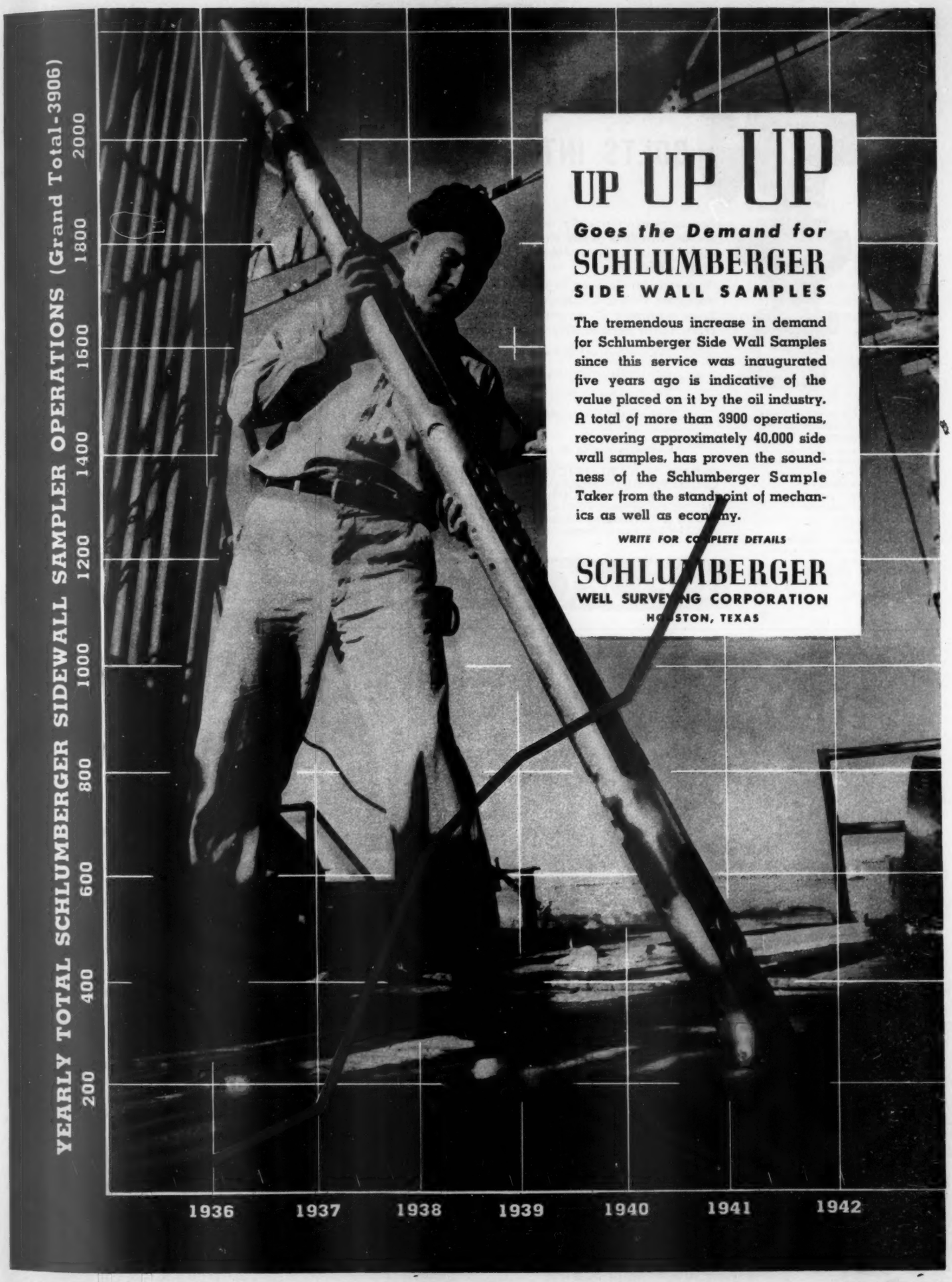
Field—	Comp.	Oil	I.P.	Gas	Dry
Belridge, North	8	8	2,240	0	0
Brea Olinda	2	2	80	0	0
Capitan	5	5	4,943	0	0
Coalinga	71	68	119,261	0	3
Coles Levee	21	18	9,629	2	1
Coyote, East	7	7	1,769	0	0
Delano	1	0	0	1	0
Dominguez	53	48	22,528	0	5
Dyer Creek	2	1	184	0	1
Edison	8	8	1,043	0	0
Elk Hills	8	8	3,767	0	0
Elwood	2	1	500	1	0
Fruitvale	2	2	240	0	0
Greeley	28	28	49,147	0	0
Helm	1	1	260	0	0
Huntington Beach	56	52	19,951	0	4
Inglewood	19	17	25,274	0	2
Jacalitos	1	1	128	0	0
Kern River	21	21	1,698	0	0
Kettleman North Dome	19	18	8,466	0	1
Long Beach	27	24	3,022	0	3
Lost Hills	5	3	18	0	2
McDonald Island	1	0	0	1	0
McKittrick	12	8	1,195	0	4
Midway-Sunset	13	11	775	0	2
Montebello	5	2	397	0	3
Mount Poso	61	57	13,895	0	4
Paloma	3	2	2,020	0	1
Potrero	2	2	800	0	0
Raisin City	7	6	2,885	0	1
Richfield	2	2	40	0	0
Rincon	8	7	1,475	0	1
Rio Bravo	25	25	35,729	0	0
Rio Vista	15	0	0	14	1
Riverdale	1	1	558	0	0
Rosecrans	18	12	1,706	0	6
Round Mountain	12	8	1,423	0	4
San Miguelito	10	10	7,320	0	0
Santa Barbara	2	1	25	0	1
Santa Fe Springs	4	4	257	0	0
Santa Maria	8	6	3,527	0	2
Santa Maria Valley	60	58	43,903	0	2
Seal Beach	6	6	5,835	0	0
Shafter	1	1	488	0	0
Strand	5	3	6,405	0	2
Summerland	1	0	0	0	1
Ten Section	37	37	59,220	0	0
Torrance	23	21	2,236	0	2
Tupman	26	25	27,236	1	0
Turnbull Canyon	1	1	225	0	0
Union Avenue	5	2	240	1	2
Ventura Avenue	43	40	54,070	0	3
Ventura-Newhall	57	40	36,160	0	17
Vernales	2	0	0	2	0
Wasco	1	1	3,136	0	0
Wheeler Ridge	1	0	0	0	1
Whittier	2	2	125	0	0
Wilmington	166	164	59,408	0	2
Wildcats	94	0	0	0	94
Total 1941	1,111	910	647,975	23	178

Completions by Months

	Comp.	Oil	Gas	Dry	Footage
January	110	92	1	17	722,491
February	88	53	0	35	452,465
March	68	58	0	10	414,625
April	98	85	0	13	467,738
May	73	65	2	6	411,039
June	96	78	5	13	613,810
July	104	83	3	18	646,730
August	105	79	3	23	549,585
September	98	79	3	16	758,483
October	88	79	0	9	470,598
November	116	98	3	15	609,722
December	67	61	3	3	393,265
Total 1941	1,111	910	23	178	6,510,551

PRODUCTION, 1937-1941

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
San Joaquin Valley:								
Arvin	.....	.....	454,092	653,023	263,088	.....	15	14
N. Belridge	5,699,911	4,869,338	4,365,916	3,861,662	3,245,267	56	71	49
S. Belridge	637,660	437,410	421,095	751,818	757,418	156	189	207
Canal	31,112	847,447	1,854,246	2,036,141	1,815,938	.....	34	35
Coalinga	5,773,718	3,903,380	5,724,621	9,934,521	14,222,443	611	906	1,044
Coles Levee	.....	10,407	358,341	1,314,126	2,194,600	....	31	50
Edison	1,578,074	1,102,756	840,805	865,660	1,017,430	89	96	111
Elk Hills	3,785,942	3,885,771	3,833,611	4,427,359	3,491,517	151	196	147
Fruitvale	3,252,200	3,088,232	2,373,766	2,072,213	2,079,669	128	170	173
Greeley	527,068	1,164,707	811,235	1,475,721	2,476,498	1	37	68
Kern River	5,555,639	4,594,022	4,225,628	3,993,777	4,321,745	1,300	1,458	1,948
Kettleman Hills, N.	29,086,867	25,588,898	19,556,609	16,720,517	13,986,676	122	265	282
Kettleman Hills, M.	49,495	19,562	8,829	.....	.....	3	.....	.....
Lost Hills	1,418,776	1,297,589	1,219,498	1,403,679	1,262,502	271	264	312
McKittrick	1,304,621	1,290,033	1,326,988	1,313,826	1,421,349	126	213	220
Midway-Sunset	26,492,082	22,869,315	18,947,029	18,400,180	17,468,113	2,318	2,503	2,740
Mountain View	6,835,954	4,034,457	2,985,728	2,421,127	1,904,722	172	176	164
Mount Poso	6,723,416	6,234,068	4,307,601	3,226,616	4,117,028	197	284	356
Paloma	.....	.....	23,711	137,763	56,397	.....	5	1
Rio Bravo	127,842	1,939,832	2,872,138	2,899,087	4,530,713	.....	69	96
Round Mountain	4,857,582	5,484,304	3,527,851	2,690,462	2,815,204	55	225	236
Strand	.....	.....	134,894	526,970	547,531	....	8	12
Ten Section	932,462	2,472,684	3,245,627	3,517,421	5,236,827	2	67	111
Tupman	.....	1,668	185,502	1,275,388	3,521,675	.....	39	58
Wasco	.....	125,168	402,647	576,444	632,709	.....	12	13
Wheeler Ridge	118,640	113,091	124,538	112,917	103,474	26	34	34
Canfield Ranch	.....	35,561	21,802	15,607	15,686	.....	2	1
Raisin City	.....	.....	.....	.....	61,004	.....	.....	6
Union Avenue	.....	.....	.....	.....	49,305	.....	.....	2
Dyer Creek	.....	.....	.....	.....	2,535	.....	.....	1
Helm	.....	.....	.....	.....	1,197	.....	.....	1
Jacalitos	.....	.....	.....	.....	4,530	.....	.....	1
Riverdale	.....	.....	.....	.....	1,050	.....	.....	1
Shafter	.....	.....	.....	.....	19,926	.....	.....	1
Total	104,789,061	95,409,700	83,154,348	86,624,025	93,825,766	5,784	7,369	8,495
Coastal district:								
Capitan	917,894	1,068,619	876,424	650,694	741,222	25	44	51
Elwood	3,206,333	2,249,495	1,542,571	1,289,183	1,162,696	78	74	59
Rincon	1,058,607	1,393,951	1,238,020	1,609,492	1,572,969	29	74	69
San Miguelito	1,148,711	1,043,902	942,537	1,168,082	1,140,198	6	26	42
Santa Barbara	247,056	158,271	112,523	85,372	73,881	56	19	17
Santa Maria	3,908,005	6,145,597	6,270,023	2,220,969	3,185,729	198	181	208
Santa Maria Valley	.....	.....	.....	6,161,770	6,925,423	....	141	199
Summerland	12,245	11,952	10,391	8,533	4,577	19	8	8
Ventura Avenue	12,688,649	12,927,740	12,941,952	12,572,804	12,882,126	245	322	340
Ventura-Newhall	1,832,561	1,907,535	3,335,411	2,866,015	4,284,912	567	519	568
Watsonville	21,900	14,125	10,920	9,150	9,125	7	7	7
Total	25,041,961	26,921,187	27,280,772	28,642,064	32,242,858	1,230	1,415	1,568
Los Angeles Basin:								
Brea-Olinda	2,656,765	2,123,223	2,067,055	2,063,905	2,077,442	360	362	367
Coyote, E.	1,389,955	1,264,726	941,942	1,388,407	1,387,376	77	87	92
Coyote, W.	2,886,120	3,084,268	3,070,48	2,667,184	3,075,304	48	78	75
Dominguez	9,840,769	9,760,460	7,125,953	7,566,914	8,505,983	130	200	283
El Segundo	3,642,486	3,887,159	1,167,566	788,640	528,043	4	39	36
Huntington Beach	13,288,645	11,934,721	9,970,806	9,493,058	10,755,232	521	547	592
Inglewood	5,521,459	5,340,024	4,707,935	4,368,839	4,893,103	201	198	207
Lawndale	31,662	28,655	19,082	14,777	10,773	6	5	3
Long Beach	21,870,310	20,654,617	16,996,027	15,995,238	14,712,021	1,242	1,216	1,200
Los Angeles-Salt L.	284,444	196,977	180,415	195,099	197,960	122	103	98
Montebello	3,173,522	4,151,535	7,451,945	7,239,899	4,894,900	196	335	342
Playa del Rey	3,186,553	2,303,767	1,792,493	1,506,399	1,317,957	212	146	136
Potrero	116,794	213,627	412,295	685,951	710,707	10	19	22
Richfield	3,149,090	3,349,814	3,132,379	3,224,543	2,702,518	260	298	310
Rosecrans	1,252,519	3,723,567	4,468,481	4,256,976	3,472,792	77	170	179
Santa Fe Springs	15,749,710	12,633,748	10,053,233	9,441,971	8,559,187	633	582	579
Seal Beach	3,415,184	3,206,135	2,642,906	2,559,998	2,401,743	56	120	122
Torrance	2,824,849	5,201,344	6,411,812	4,009,407	3,204,795	533	633	614
Whittier	334,867	338,307	322,352	180,278	169,786	158	38	154
Wilmington	14,181,162	34,202,442	31,115,816	30,203,750	30,682,198	25	899	1,072
Turnbull Canyon	.....	.....	.....	.....	14,048	.....	.....	1
Total	108,796,865	127,599,116	114,051,274	107,851,233	104,273,864	4,871	6,075	6,434
Total California	238,627,887	249,920,003	224,486,394	223,117,322	230,342,488	11,885	14,859	16,547



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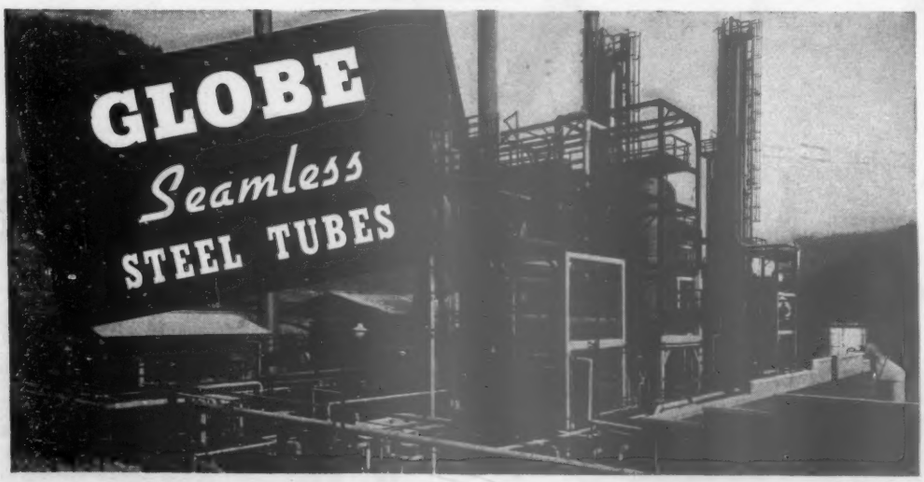

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point, after which only the drill can tell the outcome. The Cretaceous appears to have production possibilities that may later greatly affect the state's reserves of crude oil and natural gas.

California prospectors discovered 10 new oil fields and 1 gas field during 1941, but for the first time in several years sufficient drilling had not been undertaken to permit a close approximation of their importance from a production standpoint. Vernalis, the new gas field, and eight of the 10 new oil fields found last year were located in the San Joaquin Valley. The two remaining oil fields discovered were Oak Canyon in the Coastal district and Turnbull Canyon in Los Angeles Basin. Of considerable concern to California operators is the recent order restricting drilling operations to one well to each 40 acres and one gas well to each 640 acres or more. The prohibition regarding the drilling of gas wells will do no great harm if some arrangement is made to take care of property rights, but the restriction of one oil well to not less than 40 acres will upset development plans. Obviously this will affect future drilling, although it is assumed that some deviation will be allowed in order to eliminate any inequalities and permit normal development. Operators feel that the provision requiring restriction of drilling to one well to not less than 40 acres in new fields will work out to good advantage but question the wisdom of attempting to restrict drilling operations to this pattern in fields having subdivided properties or leases less than 40 acres in extent. This limitation of drilling in proved fields should result in more wildcat exploration, but increase in the latter will not be sufficient to offset decrease in the former.

New Production Plan

California started off the new year with a new production plan which was worked out by the petroleum coordinator and his staff together with E. E. Pyles and the California Production Committee for District 5. This is the first time that California has had a regulation measure as two previous attempts by the industry were overwhelmingly defeated when subjected to referendum. The present plan, which was approved late in 1941 and put into operation on January 1, 1942, incorporates a number of provisions contained in previous production regulatory measures which were voided by the general electorate. There will be no attempt under present circumstances to question the validity of the new production plan and operators are adhering to the January allowable. The new plan was not put into operation in entirety as the production committee did not have sufficient time and enough data available to carry out all provisions.

Crude-oil production during 1941 exceeded the annual production of 1940 and 1939 but was substantially below production during 1938. Production during 1942 will depend upon what the petroleum coordinator determines is necessary less the amount that will be shut in because of disrupted transportation or for any other reason. The type of crude oil to be produced will also be a governing factor but this will undoubtedly be taken into consideration in the establishing of monthly quotas. Likewise, the availability of tank and truck facilities may also be an important factor in moving crude oil especially if they are needed to move gasoline and lubricating oil to retail markets and for military purposes. The ability of the state to produce any amount of crude oil within reason cannot be questioned but under present conditions the ability of any field to produce depends upon the amount of operating outlets. A 1,000,000-bbl. field is no better than the aggregate amount of its outlets and the ability of buyers to move production to refining centers uninterruptedly. The various fields in the Coastal district of California will not enter the production picture in 1942 unless marine transportation functions efficiently and effectively.

BEND AND ELLENBURGER YIELD BEST DISCOVERIES OF YEAR

By
D. H. STORMONT

THE North Texas and West Central Texas districts during the past year underwent a widespread and intensive wildcatting campaign with the result that the areas were given a record number of new discoveries. Many of the discoveries were new pools, but the majority were in the form of deeper pays in proven areas. While the deeper drilling in North Texas for Ellenburger, Mississippian and Bend pays received most publicity, shallow horizons in both areas received more attention than in past years.

In the area as a whole there were 2,208 completions, all but 627 of which were confined to the North Texas district. Indicative of the importance that shallow drilling assumed during the year is the fact that of the total completions, 545 were less than 1,000 ft. deep and an added 765 were less than 2,500 ft. in depth. There were only 124 completions below 5,000 ft., nearly all of which were in North Texas. The number of shallow discoveries was not as large as the total for the deeper pays, but their rates of development were much faster so that they constituted a greater percentage of the total completions.

While the deeper Ellenburger and Mississippian lime pays reached their highest stage of development in North Texas, discoveries in the stratigraphically shallower Bend were far more numerous. As is shown in the accompanying table of discoveries, 9 new discoveries were made in the Mississippian, 6 were in the Ellenburger and 20 were from the Bend. With these deep pays constituting more than half of the discoveries, the Strawn pays did not maintain the prominence they have held during previous years.

Several discoveries that hold promise of becoming sizable fields were recorded from the Caddo and conglomerate sections of the Bend. Young County continued to account for bulk of

(Continued on Page 133)

NORTH TEXAS DISTRICT

Summary of Wells Completed During 1941

Field—	Comp.	Oil	Prod.	Gas	Dry
Allee	3	1	51	0	2
Antelope	34	33	16,268	0	1
Anzac-Graham	2	2	1,085	0	0
Bindel	6	6	1,224	0	0
Bonita	8	6	9,236	0	2
Briar Creek	4	2	92	0	2
Bryson	46	41	11,007	0	5
Bowers	13	10	1,299	0	3
Burns-Larrimore	4	4	1,138	0	0
Clingensmith	4	4	2,658	0	0
Coleman	5	5	13,349	0	0
Electra-Ellenburger	6	6	446	0	0
Fargo	41	37	12,309	0	4
Griffin	10	9	3,788	0	1
Halsell	1	1	185	0	0
Hapgood	2	1	336	0	1
Harrold	5	5	1,322	0	0
Hott	1	1	47	0	0
Hull-Silk	113	95	33,803	0	18
Hults-Owens	2	2	930	0	0
K.M.A. and deep	293	268	87,397	0	25
Kadane	5	3	555	0	2
Mathis	13	8	2,183	0	5
Nocona	40	32	517	1	7
Olney	184	82	3,383	0	102
Ringgold	3	1	69	0	2
Rogers & Rogers	13	12	6,048	0	1
Ross	4	3	1,120	0	1
Scotland	7	7	3,206	0	0
Sewell	19	18	2,693	1	0
Seymour	19	17	2,840	0	2
South Mankins	2	2	1,475	0	0
T.C.U.	20	19	513	0	1
Vogtsberger	1	1	29	0	0
Voth	62	57	6,071	0	5
Walnut Bend	43	39	10,095	0	4
Wildcats	244	52	16,598	3	189
Miscellaneous fields:					
Archer	170	94	6,260	0	76
Baylor	9	6	450	0	3
Clay	249	153	8,641	0	96
Cooke	88	64	1,149	0	24
Jack	27	13	729	0	14
Montague	10	9	1,586	0	1
Throckmorton	45	30	414	1	14
Wichita	167	100	3,823	0	67
Wilbarger	50	39	2,055	0	11
Young	111	63	16,806	6	42
Total 1941	2,208	1,463	297,278	12	733

Completions by Months

	Comp.	Oil	Gas	Dry	Footage
January	160	112	0	48	413,477
February	151	100	1	50	342,608
March	143	84	1	58	376,389
April	237	151	2	84	551,451
May	177	110	1	66	362,452
June	176	117	1	58	385,844
July	247	166	0	81	565,972
August	187	127	1	59	468,706
September	173	114	1	58	393,974
October	227	154	1	72	515,780
November	192	132	2	58	472,737
December	138	96	1	41	374,190
Total 1941	2,208	1,463	12	733	5,223,580
Total North Central Texas	2,835	1,727	54	1,054	6,460,034

Average footage: North Texas, 2,366 ft.; West Central Texas, 1,972 ft.; North Central Texas, 2,279 ft

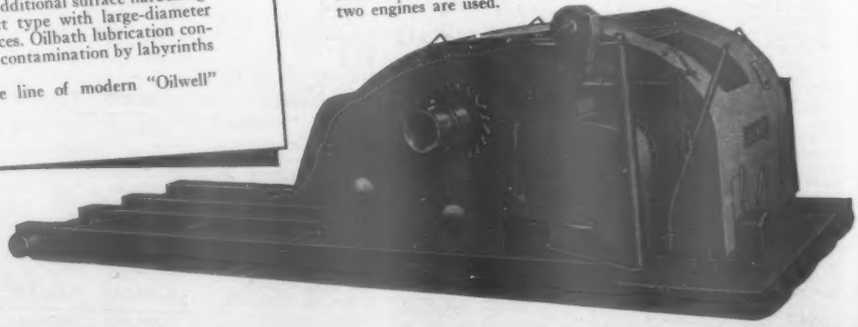
NORTH TEXAS PRODUCTION, 1937-1941

Archer County:	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Caddo	.....	.....	.....	.....	132,610	.....	.....	23
Hull-Silk-Sikes	.....	435,889	387,224	2,713,052	3,820,842	.....	392	419
Kadane	.....	.....	in misc.	.....	92,338	.....	.....	23
Mankins	.....	.....	19,256	107,000	180,185	.....	13	14
Scotland	.....	.....	7,498	5,949	57,577	.....	.....	13
Votsberger	.....	.....	.....	12,391	27,506	.....	.....	3
Miscellaneous	4,634,806	3,413,082	3,532,541	3,173,199	3,135,524	3,966	3,594	3,576
Total	4,634,806	3,848,971	3,927,919	6,171,671	7,446,582	3,966	3,999	4,071
Baylor County:								
Rendham	.....	.....	.....	13,887	52,892	.....	4	12
Seymour	.....	.....	36,769	180,004	304,677	.....	22	33
Portwood	641,522	473,595	353,994	252,454	201,905	164	146	143
Total	641,522	473,595	390,765	446,345	559,474	164	178	188
Clay County:								
Antelope	.....	.....	.....	in. misc.	254,311	.....	17	47
Burns-Browning	.....	.....	33,640	65,699	29,680	.....	3	3
Halsell	.....	.....	11,131	26,257	131,801	.....	9	9
Hepgood	.....	.....	.....	18,513	54,896	.....	3	3
Kinder	.....	.....	1,143	4,005	3,070	.....	1	1
Ross	.....	.....	.....	.....	50,411	.....	.....	10
					16,380			5
Miscellaneous	237,588	534,950	775,614	867,309	1,001,241	425	711	882
Total	237,588	534,950	821,528	981,778	1,541,760	425	744	960
Cooke County:								
Bindel	.....	.....	.....	.....	16,594	.....	.....	5
Voth	.....	.....	88,634	81,441	146,517	.....	26	69
Walnut Bend	.....	17,887	253,386	1,264,679	1,099,788	.....	81	115
Wilson	.....	.....	.....	.....	7,125	.....	.....	5
Miscellaneous	2,715,105	1,155,114	1,617,735	1,546,647	1,617,847	643	931	1,019
Total	2,715,105	1,173,001	1,959,755	2,892,767	2,887,871	643	1,038	1,213
Foard County:								
Allee	.....	.....	.....	8,821	8,522	.....	4	4
Johnson	237,134	193,811	147,296	142,726	114,189	6	11	11
Thalia	25,860	17,420	13,714	12,582	11,287	8	5	5
Total	262,994	211,231	161,010	164,129	134,008	14	20	20
Jack County:								
Bridwell	.....	.....	.....	in misc.	26,674	.....	5	5
East Bryson	.....	.....	in misc.	673,645	923,052	.....	123	152
Hoefle	.....	.....	.....	.....	5,619	.....	.....	1
Miscellaneous	3,158,519	2,586,975	2,221,465	1,335,451	1,009,988	530	622	645
Total	3,158,519	2,586,975	2,221,465	1,998,996	1,959,714	530	770	803
Montague County:								
Benton Holmes	.....	.....	23,793	116,868	245,543	.....	14	30
Bonita	.....	.....	.....	126,625	240,130	.....	18	20
Clingensmith	.....	.....	.....	.....	22,657	.....	.....	4
Hults-Owens	.....	.....	.....	.....	25,972	.....	.....	2
Ringgold	.....	.....	.....	34,205	134,546	.....	8	10
Rogers & Rogers	.....	.....	in misc.	691,941	433,651	.....	38	45
Benson	.....	.....	.....	.....	10,500	.....	.....	2
Miscellaneous	2,204,824	1,880,327	1,886,855	1,699,937	1,573,463	799	918	953
Total	2,204,824	1,880,327	1,910,648	2,669,576	2,686,462	799	996	1,066
Wichita County:								
Burkburnett	1,310,337	1,868,838	1,800,152	1,852,010	1,816,116	In misc.	In misc.	In misc.
Electra	3,225,023	3,005,077	3,124,637	2,961,976	2,804,604	In misc	In misc.	In misc.
Electra-Ellenburger	.....	.....	.....	.....	6,187	.....	.....	2
K.M.A.	1,064,971	4,977,235	8,207,319	11,496,885	9,610,631	In misc	1,489	1,607
K.M.A.-Ellenburger	.....	.....	.....	In KMA	613,173	.....	3	112
Miscellaneous	544,502	504,020	419,569	209,069	180,930	6,553	6,114	6,011
Total	6,144,833	10,355,170	13,551,677	16,519,940	15,031,941	6,553	7,606	7,732
Wilbarger County:								
Consolidated	.....	.....	in misc.	446,818	297,740	.....	30	36
Fargo	.....	.....	in misc.	5,800	358,522	.....	5	45
King	.....	.....	in misc.	33,460	21,420	.....	7	10
Harrold	.....	.....	.....	.....	25,074	.....	.....	6
Rock Crossing	.....	.....	.....	.....	13,140	.....	.....	32
Miscellaneous	3,462,226	3,218,564	.....	2,823,714	2,531,664	1,308	1,594	1,583
Total	3,462,226	3,218,564	3,063,447	3,309,792	3,247,560	1,308	1,636	1,712
Young County:								
Anzac-Graham	.....	.....	.....	.....	13,977	.....	.....	3
Blount	.....	.....	.....	.....	5,074	.....	.....	1
Kerlyn-Loving	.....	.....	.....	.....	10,118	.....	.....	1
Knight	.....	.....	in misc.	117,860	264,423	.....	13	29
Knox	.....	.....	in misc.	65,064	213,457	.....	35	41
James	.....	.....	in misc.	80,443	224,163	.....	39	57
Lupton & McLester	.....	.....	.....	.....	71,261	.....	.....	23
Sewell	.....	.....	in misc.	237,807	329,366	.....	24	42
Briar Creek	.....	.....	.....	.....	16,759	.....	.....	6
Burns-Larrimore	.....	.....	.....	.....	7,248	.....	.....	4
Miscellaneous	4,364,588	3,930,544	3,709,896	3,113,788	2,700,630	1,950	2,235	2,270
Total	4,364,588	3,930,544	3,709,896	3,614,962	3,856,476	1,950	2,346	2,477
Total N. Texas	27,827,005	28,713,318	31,718,110	38,769,956	39,357,466	16,352	19,333	20,242

THE "OILWELL" CT-1715 ROTARY DRILLING UNIT in the foreground provides a separate, compact and *cushioned* drive to the rotary. Its hydraulic torque converter, in addition to absorbing shock, assures a smooth and flexible power-flow with an unlimited selection of table speeds. The CT-1715 Drilling Unit is not a required item on an "Oilwell" Rig, but it does improve the performance of *any* power rig. And, it increases the capacity of the rig by releasing the full power of the hoisting-unit engine or engines for the slush-pump drive.

THE "OILWELL" 17½-inch OILBATH ROTARY is excellently suited for use on a power rig, either as part of an "Oilwell" CT-1715 Rotary Drilling Unit or for conventional chain drive. It is rated for drilling to 7,500 feet. Dead load capacity is 200 tons; maximum recommended speed is 400 r.p.m.; and gear ratio is 3.93:1.
This rotary is of compact construction with a low, flat and fully guarded table. The rigid cast-steel base includes integral cylindrical bearing supports for the roller-bearing pinion-shaft assembly. The quiet-running spiral-bevel gear and pinion are fully heat-treated forged steel, with the pinion given an additional surface hardening. The main bearing is of the self-centering angle-contact type with large-diameter high-precision balls and through-hardened alloy-steel races. Oilbath lubrication continuously circulates in a sealed enclosure, protected from contamination by labyrinths at both top and bottom.
The 17½-inch Oilbath Rotary is one of a complete line of modern "Oilwell" Rotaries. All have been proved in service.

THE No. 64 UNIVERSAL HOISTING UNIT is the heart of the "Oilwell" Power Rig. Compact, light in weight and extremely portable, it is rated for a maximum drilling depth of 6,000 feet with 3½-inch drill pipe or 5,000 feet with 4½-inch pipe. It provides four hoisting speeds and two rotary speeds.
The extreme simplicity of the No. 64 Universal Hoisting Unit minimizes initial cost and upkeep, and makes the rig easy to handle. Friction-clutch rotary drive facilitates spinning pipe and saves round-trip time. The instantaneous planetary reverse is also a time-saver, and a safety feature as well. An "Oilwell" Dual Hoist Drive provides operating convenience and flexibility when two engines are used.



DISCOVERIES IN NORTH TEXAS DURING 1941

Field, county, discovery well—	Location—	Date	Initial prod. (bbl.)	Depth	Number of wells 1-1-42	Producing horizon—Remarks
Housley-McCord, Throckmorton, Combined Oil 1 Housley	Sec. 28, Comanche Indian Reserve Sur., S central part of county	1/15	15 (*)	705-07	42	Cisco series
Taylor, Archer, King Oil 1 Taylor	Sec. 13, Lot 1, A.T.N.C.L. Sur., 2½ mi. SW of Hull-Silk field	3/1	59 in 16 hr. (*)	4,927-49	1	Mississippian lime
Story-Wilson, Archer, Jack Story 1 Wilson	Sec. 86, Lot 4, A.T.N.C.L. Sur.	3/17	52 in 16 hr. (½)	1,543-50	3	Cisco series formation
McKnight, Throckmorton, Humble 1 McKnight	Blk. 2, Day Land & Cattle Co., 9 mi. NW of Woodson	3/20	1,488	4,021-52	2	Caddo lime (Bend)
Bindel, Cooke, Texas Co. 1 Bindel	Sec. 1, Hughes Sur., 4 mi. NW of Muenster	3/21	243	1,885-96	4	Lower Strawn series.
Newcastle, Young, R. P. Dorian 1 Grigsby	Sec. 416, T.E.&L. Sur., 7 mi. NW Graham	4/7	52 in 3 hr.	3,974-88	2	Caddo lime (Bend)
Vaughn, Young, Carey & Carey 3 Vaughn	R. W. Nabors Sur., central part of county	4/8	58 in 3 hr.	2,474-80	1	Strawn series formation; shallower pay for deep prod. area.
New York (Mississippian), Clay, Shell 1-A Coleman	Blk. 24, Calhoun Co. Sch. Lds. Sur., 8 mi. SE of Henrietta	4/10	138 in 3 hr.	6,158-6,283	5	Mississippian lime
Burns-Larrimore, Young, L. T. (Bobby) Burns 1-A Larrimore	Blk. 150, T.E.&L. Sur., just S of CNL of county	4/10	835 in 12 hr.	4,897-4,927	5	Mississippian lime
Harrold, Wilbarger, Kadane 1 Schaffke	Sec. 3, Blk. 14, H.&T.C. Sur.	4/26	122 (*)	3,165-82	1	Strawn series
Harrold, Wilbarger, Kadane & Fidel 1 Cochran	M.K.&T. Sur., Abst. 1891	4/27	38 an hr.	3,271-81	4	Strawn series; deeper pay
Benson, Montague, Benson & Benson 1 Seay†	J. P. Owensby Sur., Abst. 578, 3 mi. SE of Ringgold field	5/3	244 (*)	5,752-62	2	Conglomerate (Bend)
Clingensmith, Montague, Sinclair Prairie 1 Clingensmith	Sec. 149, Belcher Subd. of Jose Olabarri Sur., Abst. 579, 3 mi. SE Rogers & Rogers field	5/4	154 in 3 hr.	6,119-31	4	Conglomerate (Bend)
Antelope (Mississippian), Clay, Shell 9 Henderson	Sec. 2605, T.E.&L. Sur.	5/9	1,203 in 9 hr.	5,670-5,760	1	Mississippian lime; deeper horizon for field.
Worsham, Clay, Gulf 1 Scaling	Blk. 3, T.&N.O. Sur., 12 miles E and little S of Henrietta	6/22	112 in 3 hr.	5,780-92	1	Ellenburger lime (Ordovician); deeper pay for field.
Unnamed, Jack, Joe Worsham 1 Simpson	J. W. Abbey Sur., Abst. 11, central part of county	5/26	8 bbl. (*)	3,005-22	1	Strawn series
Bindel, Cooke, Texas Co. 1 Flietman	W. Simpson Sur.	5/29	600	3,242-47	2	Ellenburger lime (Ordovician)
Electra, Wichita, Magnolia 65 Waggoner	Sec. 15, Blk. 13, H.&T.C. Sur.	6/8	64 bbl.	2,992-96	1	Ellenburger lime (Ordovician)
Logan, Young, Ben Rankin 1 Bell Logan	J. W. Duty Sur., just south of Knox field	6/9	8 (*)	4,488-4,502	1	Caddo lime (Bend)
Bridwell-Meyers, Clay, Bridwell 2 Meyers	Thompson Sur., 18 mi. due S Henrietta	6/12	75 bbl. in 3 hr.	5,776-92	1	Caddo lime (Bend)
Burns-Browning, Clay, Burns 1 Southerland	Blk. 63, Belcher subd., ½ mi. E Browning field	6/16	60 oil, 9 wtr. in 3 hr.	3,792-3,885 3,924-39	2	Lower Strawn series; shallower horizon for Browning field.
Williamson, Young, T. D. Humphrey 1 E. G. Williamson	SE SE Sec. 601, T.E.&L. Sur., 2 mi. SW Jean	6/20	35 in 24 min.	5,003-35	3	Mississippian lime.
Gilmore, Young, Wrightsman Oil 1 Gilmore	Sec. 3, B.B.B.&C. Sur., 4 mi. SE of Graham	7/2	82 oil, 35 wtr. (*)	2,483-91	1	Strawn series
Consolidated, Wilbarger, Consolidated et al 4-B Ancell	NW NW NE Sec., Blk. 7, H.&T.C. Sur.	7/2	102 oil, 40 wtr. (*)	4,369-81	2	Ellenburger lime
Wilson, Cooke, Harvey Drlg. 1 Wilson-Ware	W. W. Crisp Sur. A-221, 2½ mi. NE Anderson-Kerr	7/8	72 (*)	2,221-27	2	Strawn sand
Harrold, Wilbarger, Bix Six (Kadane & Fiedel) 1 Orr	Sec. 2, Blk. 14, H.&T.C. Sur.	7/17	176 oil, 138 wtr.	3,306-10	1	Strawn series; deeper pay for field
Jermyn, Jack, G. M. Gillespie et al 4 Loving	NE NW NW Sec. 3346, T.E.&L. Sur., 3 mi. SE Jermyn	7/24	197 (*)	3,273-86	1	Strawn series; new deeper pay for field
Electra-Ellenburger, Wichita, Magnolia 79 Burnett	SW SE SW Sec. 6, H.&T.B. Sur. A-428	7/24	108 in 3 hr.	3,627-35	2	Ellenburger lime; first prod. from this pay.
Golden, Clay, George G. Golden 1 Texas Joint St. Land Bk. "B"	Sec. 13, Thornberry subd.	8/5	20 (*)	1,123-27	14	Cisco series
Burn-Ragland, Young, L. T. Burns et al 1 Ragland	NE W½ Blk. 257, T.E.&L. Sur., 2½ mi. NE of True	8/20	161 in 3 hr.	3,970-4,052	1	Caddo lime Bend)
Newcastle, Young, Dorian & Mitchell 1 Daniels	SW cor. Blk. 421, T.E.&L. Sur., 2 mi. E of Newcastle	8/22	42 in 1 hr.	4,413-35	3	Marble Falls (Bend); deeper pay for field.
Cartwright, Archer, W. B. Hamilton et al 22 Cartwright	SW cor. James Webb Sur. A-664	8/23	8 oil, 25 wtr. (*)	5,149-64	1	Bend series.
Mathis, Jack, Paul Steed et al 1 Dunlap	NE cor. B.S.&F. Sur.	8/25	24 (*)	3,246-57	1	Strawn series; new deeper pay
Wynn, Clay, L. T. Burns et al 1 Wynn	SE SE Sec. 34, H. Williams Sur. A-704, 1 mi. W of Joy	9/3	73 in 3 hr.	5,905-67	1	Mississippi lime
Wilson, Cooke, Harvey Drlg. Co. 1 Wilson-Ware	W. W. Crisp Sur. A-221	9/4	96 (*)	2,360-80	3	Strawn sand; deeper pay
Hott, Montague, Lesh & McCall 5 Davenport	J. Fitch Sur., NE part of county	9/7	250	2,471-84	2	Strawn series; deeper pay for field
Meyers, Jack, Elmore Oil 1 Meyers	SE J. N. Rudmose Sur. A-1803, 7 mi. NW Jacksboro	9/8	55 in 6 hr.	2,386-88	1	Strawn sand; new deeper pay
Stewart, Jack, Rankin & Elliott 1 W. T. Stewart	SE cor. Sec. 2799, T.E.&L. Sur.	9/10	160 (*)	3,485-3,500	1	Strawn series
Thomas, Montague, Shell 1 Thomas	SW Blk. 95 Kaufman C.S.L. Sur., 7 mi. N of Bonita	9/11	64 (*)	3,023-45	1	Strawn series
Benson, Montague, Superior Oil 1-A W. D. Seay	A. B. Morton Sur., Abst. 1175	9/17	116 in 8 hr.	5,839-50	1	Bend series; deeper pay
Anzac-Graham, Young, Anzac Oil 1 M. K. Graham	W½ A. E. Gossett Sur. A-1802	10/3	85 (*)	4,432-74	1	Mississippi lime; deeper pay
Turner, Montague, W. H. Gant et al 1 Turner	NE NE Sec. 59, E.T. Sur., 5½ mi. NE of Bowie	10/6	80 in 5 hr.	6,222-34	1	Bend series
Aller, Young, Panhandle Refg. 1 Aller-Hunt	NE Sec. 3409, T.E.&L. Sur., 14 mi. W of Graham	10/9	76 oil, 5 wtr. (*)	2,706-11	2	Strawn sand
Kerlyn-Loving, Young, Kerlyn et al 1 Hazelton	SW NW Sec. 1995, T.E.&L. Sur.	10/15	15 oil, 15 wtr. (*)	3,384-94	1	Strawn sand
Rock Crossing, Wilbarger, Phillips 10 Waggoner-Bates	NE NW NE Sec. 43, Blk. 4, H.&T.C. Sur.	10/15	94 in 3 hr.	3,805-15	2	Ellenburger lime
Scotland, Archer, Shell 4-A Coleman	NW cor. Sec. 74, Lot 3, A.T.N.C.L. Sur.	10/16	316 in 2 hr.	5,550-60	1	Mississippian
Taylor, Young, Kerlyn-Phillips 1 E. Taylor	SE SW Sec. 2, B.S.&F. Sur. A-2265	10/27	174 in 6 hr.	4,205-55	2	Bend series
Parrott, Throckmorton, Nash & Windfohr 1 Parrott	SW SW Sec. 951, T.E.&L. Sur., 5 mi. NW of Woodson	10/28	76 oil, 12 wtr. (*)	4,002-17	1	Caddo lime; deeper pay ¾ mi west of old shallow area
Hoefle, Jack, Taulbert-McKee & Sinclair 1 M. Hoefle	SW cor. A. James Sur., 12 mi. NW of Jacksboro	10/30	303 in 3 hr.	4,817-35	1	Caddo lime; 4 mi. SE of Antelope field in Clay
Williamson, Young, T. D. Humphrey et al 1-A Williamson	NW SW Sec. 300, T.E.&L. Sur.	11/13	98 oil, 125 wtr. (*)	3,975-4,025	1	Bend, shallow pay for pool
Sisk, Wichita, Paul H. Sisk et al 2 L. A. Sisk	Blk. 15, Lge. 2, Denton C.S.L. Sur. A-57	11/14	4 (*)	98-100	1	Cisco sand
K.M.A., Wichita, Deep Oil Dev. 4-E Bradley	SW cor. J. Beckman Sur. A-368	11/19	50 in 3 hr.	3,963-92	1	Bend lime
Orsburn, Cooke, James Anderson 1 Orsburn	NE cor. B. Sullivan Sur. A-581, 1 mi. NE of Wilson pool	11/21	10 (*)	2,309-20	1	Strawn series
Maxey, Jack; Alma Oil 1 Maxey	NE SE Sec. 2, S.P. Sur., NW part of county	11/24	13 (*)	5,255-5,425	1	Mississippi lime
Chapman-McFarlin, Montague, Chapman-McFarlin & Deep Oil 1 Fowler	SE cor. J. W. Massie Sur. A-463, 4 mi. S of Ringgold	11/25	96 in 2½ hr.	4,840-57	1	Strawn
K.M.A., Archer, C. H. Staley et al 22 Mangold	Blk. 30, P. Castleman Sur., SW edge of field	12/9	144 (*)	1,728-35	1	Gunsight (Cisco)
Parsons, Archer, Clark et al 1 Parsons	NW cor. Blk. 3, Robert-Meade Sur.	12/10	10 (*)	1,429-39	1	Gunsight (Cisco)
Stoneburg, Montague, Continental 1 Winder	Sec. 4, Limestone C.S.L. Sur., 2 mi. E of Stoneburg	12/17	464	6,233-41	1	Nocona lime (Bend); failed to make prod. in Mississippian
Unnamed, Young, Kerlyn-Phillips 1 McClure	SW Sec. 1952, T.E.&L. Sur., NE part of county	12/22	104 in 4 hr.	4,049-59	1	Caddo lime (Bend)
Unnamed, Clay, Continental 1 Spring	NW cor. Blk. 4, H.&T.C. Sur., 5 mi. E of Henrietta	12/24	104 in 8 hr.	5,587-5,630	1	Caddo lime (Bend)

*Pumping. †Deepened to 5,783-91 ft. and on August 17 recompleted for 78 bbl. oil in 3 hr.

PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

Fields—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
K.M.A.	10,224,104	28,011	804,199	730,088	818,631	779,648	864,833	834,366	813,872	873,091	841,692	935,489	945,954	991,341
Hull-Silk	3,820,842	10,466	307,632	287,481	313,986	307,287	345,238	330,813	296,059	317,635	304,224	331,960	336,686	342,111
Electra	2,810,791	7,701	239,010	220,460	245,925	235,520	240,250	229,525	237,941	237,352	229,492	232,615	230,224	232,677
Burkburnett	1,816,116	4,976	160,350	135,130	150,350	144,900	150,660	148,350	156,380	152,675	148,893	156,629	156,754	154,825
Walnut Bend	1,099,788	3,013	140,011	107,583	87,206	72,911	81,894	80,775	78,341	84,817	81,095	90,565	94,268	100,322
East Bryson	923,052	2,529	68,810	65,568	72,064	70,909	77,679	77,370	75,276	80,662	73,958	85,620	86,800	88,336
Rogers and Rogers	433,651	1,188	62,306	46,347	37,191	31,549	34,946	3,546	32,751	34,986	32,965	36,608	38,238	40,318
Fargo	358,522	982	12,525	9,758	13,506	16,600	21,885	25,075	26,268	37,582	29,383	48,519	52,649	64,772
Sewell	329,366	902	26,394	24,485	24,076	23,637	26,140	26,092	24,959	28,310	28,764	32,703	31,377	32,429
Seymour	304,677	835	20,138	20,944	22,478	24,022	24,836	25,552	25,599	29,900	30,195	33,815	34,109	35,089
Antelope	259,311	697	9,875	10,463	11,922	14,415	18,787	22,039	20,085	25,416	22,704	28,413	29,983	30,227

DISCOVERIES IN WEST CENTRAL TEXAS DURING 1941

Field, county, discovery well—	Location—	Date	Initial prod. (bbl.)	Depth	Number of wells 1-1-42	Producing horizon—Remarks
Cook Extension, Shackelford, Roeser-Pendleton and Continental 1-A-118 Cook	Sec. 117, E.T. Sur., W of Cook field	1/10	55 (*)	1,698-1,700	15	Lower Hope sand (Cisco)
East Noodle Creek, Jones, Humble 2 J. C. Sears	Sec. 37, Blk. 18, T.&P. Sur., 3 mi. E of Noodle Creek field	1/16	1,182	1,182	4	Swastika zone (Cisco)
Overall, Coleman, Anzac Oil 1 Sealy-Smith	Sec. 13, Blk. 1, G.H.&H. Sur.	2/27	100	2,215-21	1	Cross-Cut sand (Canyon); deeper level for field.
McCaulley, Fisher, F. A. Stephenson 1 J. L. Maberry	Sec. 56, H.&T.B. Sur., SE of McCaulley	3/14	100—10 hr.	3,277-3,320	4	Canyon series
Elliott, Shackelford, Haggerty & Grossenbacher 1 Elliott	Sec. 12, Lunatic Asylum Lands Sur., 8 mi. S Albany	3/17	15 (*)	833-840	10	Humble sand (Cisco)
Stith, Jones, Danciger Oil & Refg. 2 Kelso	Subd. 82 of De Witt Co. Sch. Lds. Sur.	4/7	102	2,773-78	3	Swastika sand (Cisco); deep level for field
Wimberly, Jones, Hines & Brookover 1 Wimberly	Subd. 87 of De Witt Co. Sch. Lds. Sur., between Akard and Stith	4/12	166—14 hr.	2,538-53	2	Gunsight (Cisco)
Silver Valley, Coleman, States Oil 1 Hudson	Sec. 22, Blk. 2, T.&N.O. Sur., 3 mi. E Novice field	5/8	10,060,000 cu. ft.	3,482-86	1	Fry sand (Strawn); gas discovery for pool.
Noland, Palo Pinto, W. K. Gordan 1 Noland	Sec. 86, Blk. 3, T.&P. Sur., 13 mi. SW Palo Pinto	5/10	1,185,000 cu. ft.	4,352-62	1	Strawn series
Kirk, Eastland, Arnold Kirk 1 J. W. Adams, Jr.	David McFadden Sur., Abst. 370	5/11	3,020,000 cu. ft.	2,794	1	Caddo lime (Bend)
Brownwood, Brown, Hightower Oil & Refg. 1 Buckner Orphan's Home	Wm. Iron Sur.	5/18	76—6 hr.	1,419-1,533	2	Caddo lime (Bend)
Noodle Creek, Jones, Humble 3 Huddleston	Sec. 49, Blk. 18, T.&P. Sur.	5/20	251	2,415-25	1	Noodle Creek lime (Cisco); shallow pay for field
Diller, Callahan, Clark & Young 2 Diller	Sec. 54, L.A.L. Sur., near Shackelford County line	5/26	10 (*)	437-441	6	Cisco series
Hodges, Jones, W. W. Fondren 1 Hodges	Sec. 32, Blk. 18, T.&P. Sur., 3 mi. E of Noodle Creek field	6/10	26¼	2,951-57	1	Swastika pay (Cisco)
Greynolds, Brown, Guyle Greynolds 1 Crownover	SE Sec. 26, B.B.B.&C. Sur., extreme NE cor. of county	6/18	4,070,000 cu. ft.	2,895-2,948	1	Caddo lime (Bend)
Wimberly, Jones, Brookover 1 Church	SE cor. Sec. 88, De Witt Co. Sch. Lds. Sur.	6/24	296 oil, 164 wtr. (*)	2,425-38	1	Lower Hope (Cisco) formation; shallower pay for field
Merkel, Taylor, W. H. Peckham 1 Buel Perry	NW Lot 5, League 124, Grimes C.S.L. Sur.	6/28	71 (*)	2,013-19	2	Dothan sand (Cisco)
West Avoca, Jones, M. J. Delaney 1 O. L. Short	SE SW Sec. 191, B.B.&C. Sur., between Avoca and Griffin pools	7/30	199 in 10 hr.	3,240-45	1	Palo Pinto (Canyon); separated from Avoca and Griffin by dry holes
Spurrier, Jones, Falls Ref. 1 Spurrier	Lot 1, Blk. 6, W. C. Walker Sur., NE cor. of county	7/1	10 (*)	1,908-09	1	Cisco sand; NE of Spurrier field
West Brownwood, Brown, Claude Campbell et al 1 Smith	Sec. 1, Waco Mfg. Sur.	7/23	5 (*)	931-47	1	Cisco sand
Crites, Haskell, J. W. Crites 1 Hendricks	NE cor. J. Fenner Sur. A-582	7/31	13 MCF	1,476-89	1	Cisco; ½ mi. N of Superior oil field
Kirk, Comanche, O. L. Stutenrouth 1 Pearl Kirk	NE cor. John Tabot Sur. A-941, 4 mi. NE Sipe Springs	8/2	50	2,554-2,603	1	Marble Falls (Bend)
Silver Valley, Coleman, States Oil 1 Featherstone	M. J. Gabel Sur. 118, 2½ mi. E Novice field	8/6	263 in 6 hr.	3,516-61	7	Gray sand (Strawn)
Dyer, Shackelford, Ungren & Frazier 2-A Dyer	SW SE Sec. 86, Blk. 12, T.&P. Sur.	8/6	15 (*)	925-29	2	Cisco sand
Elliott, Shackelford, R. H. Roark 1-A Elliott	SE SW Sec. 9, L.A.L. Sur.	8/13	6.65 MCF	2,878-89	1	Canyon
Loving, Stephens, C. Andrade et al 1 Walls Pasture Co.	NE NE Sec. 13, O.A.L. Sur., near Shackelford line	8/17	1.185 MCF	4,069-82	1	Lower Caddo; deeper pay and 1 mi. W extension
East Wimberly, Jones, J. L. Collins & Co. 1 Fikes	NE Lot 105, De Witt C.S.L. Sur.	8/26	300 in 13 hr.	2,234-46	6	Flippen sand (Cisco); east of Wimberly pool
Talpa, Coleman, Brannon & McMurray et al 1 Norris	SW SW cor. 160-ac. tract, J. Greenwood Sur. 304	9/14	76 oil, 25 wtr. (*)	2,600-30	1	Strawn
Merkel, Taylor, Lewis Prod. 1 Huddleston	Lot 6, Grimes C.S.L. Sur. 124	9/18	190, p. & f.	2,622-26	5	Lower Hope (Cisco); deeper pay for field
Wimberly, Jones, J. L. Collins 2 O. J. Fikes	Lot 105, Godwin subd., De Witt C.S.L. Sur. 126	10/18	163 in 9 hr.	2,337-42	3	Upper Hope (Cisco)
Jim Ned, Coleman, Merry Bros. & Perini 1 Greer	SW Lot 2, H. Kegans Sur. 520	10/28	152	3,909-37	3	Gray sand (Strawn)
Eliasville, Stephens, Christi Bros. et al 1 Donnell	NE SE Sec. 1208, T.E.&L. Sur.	11/18	25 (*)	4,210-15	1	Bend; new deeper pay for field
Unnamed, Stephens, T. G. Shaw, Tr. 1 Whalen	NW Sec. 1089, T.E.&L. Sur.	12/24	10.45 MCF	4,077-95	1	Marble Falls (Bend)

*Pumping.

AMERADA PETROLEUM CORPORATION

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PRODUCERS OF OIL AND GAS

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WEST CENTRAL TEXAS PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

Fields—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Lewis-Steffins	663,968	1,819	59,348	53,227	58,804	54,261	60,045	58,467	54,757	54,910	53,520	50,931	52,302	55,396
Royston	471,300	1,291	40,265	37,909	41,477	40,101	42,943	40,973	40,262	40,564	37,560	36,719	36,321	37,106
Griffin	469,284	1,286	37,157	32,638	34,038	31,912	34,784	42,446	40,140	42,371	39,495	44,401	44,675	45,727
Ivy	440,457	1,207	40,689	36,637	39,267	34,916	38,876	37,108	35,904	35,623	33,727	35,835	35,664	36,211
Avoca	403,774	1,106	30,545	27,612	29,222	27,142	29,787	36,740	35,272	37,315	33,929	38,426	38,423	39,361

the discoveries in the Caddo and Marble Falls. Also several strikes in these pays were recorded in Archer, Jack and Wichita counties along the Bend arch and at its mergence with the Red River uplift. The conglomerate discoveries of the Bend were along the south flank of the Red River uplift in eastern Clay and western and central Montague counties. These discoveries largely were associated with deep-seated structures outlined by the extensive Fort Worth basin play started in 1939.

The Mississippian lime which had been productive at only one or two spots in North Texas previous to the start of the year, came into much greater prominence during the year. Although this pay horizon may occur in most areas throughout the district, immediately underlying the Bend series, most of the Mississippian strikes recorded were in Young and Clay counties. Its productive limits are being widened, however, due to more and more operators carrying their tests to this level. Two of the discoveries in the Mississippian were in Archer County and one was in northwestern Jack; this year it is probable that other North Texas counties will add this horizon to their lists of oil pays.

Initial development of these Mississippian fields indicates that operators will encounter considerable difficulty in establishing the horizon as a widespread productive pay. Thinning of the section due to erosion of the Mississippian and thickening of the shale section is expected to be the chief source of trouble.

At the first of the year Ellenburger production was confined to shallow pools associated with the Muenster arch in Cooke and two wells in the K.M.A. field. During the year, however, Ellenburger productive acreage in K.M.A. was extended to over 3,000 acres by the completion of 110 deep wells thereby to account for the greatest new oil reserve added in North Texas during 1941. The deeper pay is proving more prolific than the regular K.M.A. lime in the portions of the field where the Ellenburger produces, so that in recent months deep completions are exceeding those in the Strawn pay.

In addition to the great extension of productive Ellenburger acreage in K.M.A., production from this horizon was opened in the old Rock Crossing pool and Consolidated fields of Wilbarger County, in the old shallow Electra area, in the shallow Worsham field of Clay and in the Bindel field of Cooke County. All of these discoveries, however, have not had sufficient development to evaluate the extent of productive acreage from this pay.

WEST CENTRAL TEXAS

A total of 31 new pools or new producing horizons were opened in the West Central Texas district as the result of intensive exploratory drilling during most of the year and chiefly in the latter few months. As in recent past years Jones County accounted for many of the new strikes, nearly all of which were from sands in the Cisco series. Operators drilled several tests to the deeper horizons in Jones County, chiefly to the Palo Pinto of the Canyon, but with no exception

(Continued on Page 139)

Summary of Wells Completed During 1941

Field—	Comp.	Oil	Prod.	Gas	Dry
Akard	20	18	2,516	0	2
Albany	11	6	158	0	5
Amity	4	4	105	0	0
Avoca and North	9	4	713	0	5
Bluff Creek	15	10	633	0	5
Brownwood (gas)	14	2	329	10	2
Byrd's Store	1	1	87	0	0
Cisco	2	1	91	1	0
Carbon	9	8	807	0	1
Cook	17	16	1,185	0	1
Cross Cut	11	6	35	0	5
Davis	3	3	66	0	0
Dibrell	1	1	4	0	0
Echo	7	5	1,151	0	2
Ghio	2	1	5	0	1
Goldsboro	2	2	170	0	0
Hamby	6	4	206	0	2
Harvey	2	2	154	0	0
Hendricks (gas)	1	0	0	1	0
Higgs	4	4	243	0	0
Lewis	29	22	3,181	0	7
Loving	10	8	1,786	1	1
McElreath	1	0	0	1	0
McMillan	4	1	178	0	3
Merkel	4	4	869	0	0
Nail	6	4	543	0	2
Newell	4	3	65	0	1
Noodle Creek and East	7	5	1,866	0	2
Nowles	1	1	18	0	0
Novice	12	10	1,209	0	2
Overall	2	1	118	0	1
Olson	1	1	317	0	0
Pottsville (gas)	4	0	0	3	1
Putnam	4	0	0	1	3
Reid	2	1	30	0	1
Salt Creek	2	0	0	1	1
Santa Anna	6	0	0	6	0
Sayles	15	15	2,091	0	0
Sewalt	6	5	60	0	1
Silver Valley	8	8	1,904	0	0
South Carbon	3	3	1,180	0	0
Stewardson	1	1	15	0	0
Strawn	3	1	10	0	2
Stith	5	3	564	0	2
Stroud	1	1	128	0	0
Swastika	1	1	640	0	0
Triplett	7	3	526	0	4
View and South	13	5	553	3	5
Wimberly	10	10	2,950	0	0
Wildcats	243	25	3,800	12	206
Miscellaneous fields	71	24	1,140	2	46
Total 1941	627	264	34,399	42	321

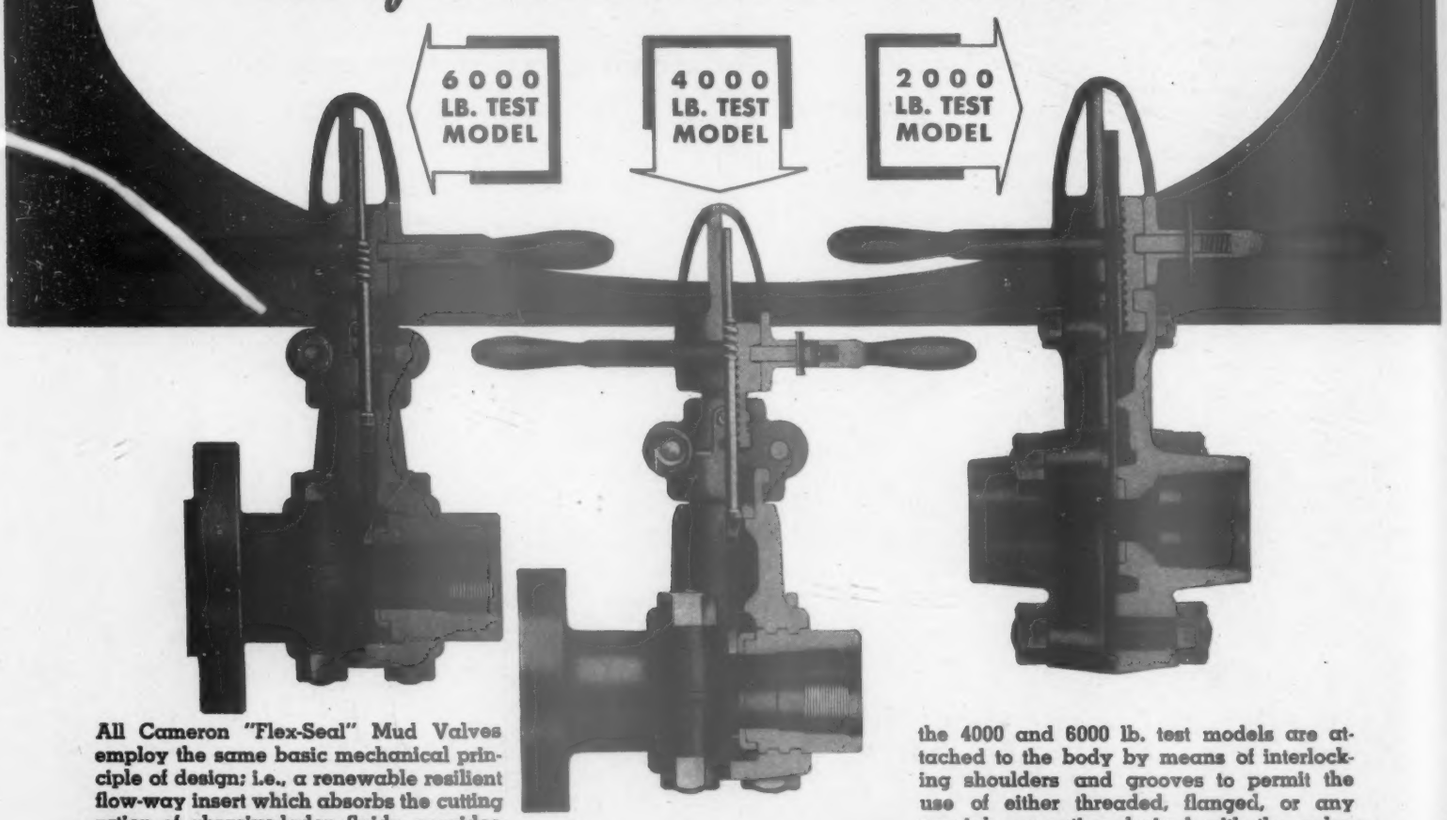
WEST CENTRAL TEXAS PRODUCTION, 1937-1941

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Brown County:								
Miscellaneous	625,556	584,403	561,703	521,839	478,584	1,064	895	859
Total	625,556	584,403	561,770	521,839	481,601	1,064	895	861
Callahan County:								
Scranton	.....	.....	14,948	29,388	20,018	.....	8	7
Miscellaneous	516,023	452,876	393,120	380,651	343,371	1,351	1,208	1,158
Total	516,023	452,876	408,068	410,039	363,389	1,351	1,216	1,165
Coleman County:								
Anzac-Morris	.....	.....	.....	38,213	47,765	.....	5	9
Goldsboro	.....	.....	.....	54,592	74,929	.....	9	11
Novice	.....	.....	17,710	51,126	33,361	.....	6	9
North Novice	.....	.....	.....	127,582	259,353	.....	22	36
Overall	49,644	43,965	14,304	11,218	24,365	24	10	7
Silver Valley	.....	.....	.....	.....	26,232	.....	.....	7
Miscellaneous	331,580	325,664	339,471	300,920	240,374	373	320	308
Total	381,224	369,629	371,485	589,581	718,192	397	374	390
Comanche County:								
Amity	.....	.....	.....	87,139	73,732	.....	46	57
Miscellaneous	21,262	25,352	60,432	22,986	22,416	85	60	60
Total	21,262	25,352	60,432	110,125	96,148	85	106	117
Eastland County:								
Carbon	.....	.....	.....	.....	41,094	.....	.....	12
Miscellaneous	1,024,054	1,011,950	948,659	912,679	825,126	508	458	444
Total	1,024,054	1,011,950	948,659	912,679	866,220	508	458	456
Erath County	36,240	29,333	23,692	27,716	28,663	96	19	17
Fisher County:								
McCaulley	46,715	21,616	11,967	16,023	20,436	3	5	4
Rotan	100,888	421,834	365,520	224,146	152,873	.....	35	33
Royston	1,111,992	765,689	660,595	558,628	471,300	105	101	103
Total	1,259,595	1,226,764	1,056,141	811,744	652,855	108	142	142
Jones County:								
Akard	.....	.....	18,834	30,875	78,094	.....	7	24
Avoca	41,076	367,939	521,827	415,120	403,774	8	55	55
Avoca, N.	.....	.....	.....	4,637	39,440	.....	3	7
Griffin	.....	4,540	663,612	627,816	469,784	.....	66	66
Hawley	382,911	176,874	175,199	134,443	119,358	64	65	64
Lewis-Steffins	18,569	248,715	528,926	604,163	665,968	5	179	186
Sayles	199,542	373,291	413,776	325,414	322,668	28	59	79
South Noodle	.....	.....	.....	.....	30,175	.....	.....	4
Triple H	.....	.....	.....	.....	28,216	.....	.....	5
Miscellaneous	1,704,192	911,512	533,801	824,576	361,171	102	190	181
Total	2,346,290	2,082,871	2,897,770	3,009,696	2,586,538	207	634	700
Palo Pinto County	115,703	113,909	127,914	127,855	99,175	185	147	129
Shackelford County:								
Ivy	.....	147,676	441,356	519,890	440,457	.....	80	80
Nail	.....	.....	.....	.....	49,397	.....	.....	12
Miscellaneous	2,568,262	2,007,250	1,711,934	1,767,628	1,625,908	1,725	1,944	1,961
Total	2,568,262	2,154,926	2,153,290	2,287,518	2,115,762	1,725	2,024	2,053
Stephens County:								
Loving	.....	.....	2,655	35,111	57,511	.....	4	10
Stribling	.....	.....	.....	93,351	50,797	.....	13	13
Miscellaneous	1,495,948	1,356,743	1,229,329	1,183,298	1,088,710	731	605	592
Total	1,495,948	1,356,743	1,231,984	1,311,760	1,197,018	731	622	615
Stonewall County:								
Carlile	.....	11,394	28,927	22,818	22,461	.....	2	2
Total	.....	11,394	39,198	38,801	37,305	.....	4	4
Taylor County:								
Merkel	.....	.....	.....	.....	17,658	.....	.....	6
Southview	.....	.....	.....	30,967	74,177	.....	5	11
Miscellaneous	24,190	28,448	30,767	30,356	28,843	11	9	11
Total	24,190	28,448	59,652	119,025	137,775	11	31	44
Throckmorton County:								
Miscellaneous	145,886	113,662	104,143	100,684	165,617	152	152	220
Total	145,886	113,662	104,143	100,684	177,722	152	152	222
Runnells County:								
Beddo	.....	567	2,897	20,130	28,541	.....	4	4
McMillan	.....	.....	22,437	17,166	3,672	.....	9	1
Total	.....	567	25,334	37,296	32,213	.....	13	5
Total W. C. Texas*	10,565,494	9,596,381	10,102,274	10,434,434	9,603,760	6,441	6,826	6,929
Daily average	28,946	26,291	27,677	28,509	26,312			

*Includes abandoned and miscellaneous fields. Production from miscellaneous fields in 1941: West Brownwood, 3,017 bbl.; Gayle, 11,813 bbl.; Bennett, 7,346 bbl.; Haskell County, 12,548 bbl.; Appling, 13,474 bbl.; West Avoca, 6,091 bbl.; Reid, 15,125 bbl.; Stith, 11,168 bbl.; Strand, 9,736 bbl.; Wimberley, 18,357 bbl.; East Wimberley, 13,629 bbl.; Nolan County, 636 bbl.; Aspermont, 8,941 bbl.; Boyd, 5,903 bbl.; Bowles, 13,974 bbl.; Lake Kirby, 3,213 bbl.; Merkel, 17,658 bbl.; McKnight, 12,105 bbl.; McMillan, 3,672.

THREE GREAT MUD VALVES

All of Them Cameron "Flex-Seal"



All Cameron "Flex-Seal" Mud Valves employ the same basic mechanical principle of design; i.e., a renewable resilient flow-way insert which absorbs the cutting action of abrasive-laden fluids, provides a pressure-tight seat for the gate, and seals the two-piece valve body. This unique feature accounts for the tremendous saving in mud valve maintenance experienced by operators who have standardized on Cameron "Flex-Seal" Mud Valves.

Note in the above cross-section views the bodies are split to permit quick and easy replacement of flow-way inserts. No special tools or skill required. Note, also, that the hubs on the 4000 and 6000 lb. test models are attached to the body by means of interlocking shoulders and grooves to permit the use of either threaded, flanged, or any special connection desired with the valve body. This feature permits the valve to swivel like a union when making up in a manifold. Wear rings protect the major parts of all models against cutting.

Complete details on these, the industry's surest sealing, money saving mud valves are carried in your Composite Catalog, or descriptive literature will be gladly sent on request.

CAMERON
IRON WORKS, INC.

CENTRAL LOUISIANA WILCOX SAND PLAY LEADS IN ACTIVE YEAR

By R. MARNE SANFORD

SHREVEPORT, La.—By far the most significant feature of the past year's activity in this district was the extensive development of the Wilcox trend of fields throughout Central Louisiana. Other discoveries were made in northern Louisiana, namely deep production in both the Lisbon and the Haynesville fields, which will be of increasing importance during the coming year.

Ten new Wilcox sand discoveries were recorded the past year in four different parishes, and this, together with the existing three fields at the start of the year, totals 13 productive spots in the district. Not only were the discoveries themselves important, but steady and rapid development has been carried on throughout the entire district so that now many of the fields are among the most important in the North Louisiana area.

During the first half of the year the development was restricted to the Olla-Nebo trend in northern La Salle Parish, however, during the latter part of the year new fields were opened farther to the south and in altogether new areas. All of this production to the south is considerably deeper than in northern La Salle Parish. All of southern La Salle, Catahoula and Concordia parishes, and most of Rapides and Avoyelles parishes is low, swampy timber land which offers

DISCOVERIES DURING 1941

Field, parish, owner, well number—	Location	Date of completion	Producing formation	Producing depth	Total depth	Initial production	No. of wells	Remarks
NORTH LOUISIANA								
Ajax, Natchitoches, J. E. Watt 1 Tanner	18-10n-10w	March	Paluxy	3,208-13	3,430	5	2	Prod. 25 bbl. salt wtr.
Little Creek, La Salle, Placid Oil Co. 1 Doughty	32-9n-2e	March	Wilcox	2,384-2,400	3,615	192	51	
South Olla, La Salle, Placid Oil Co. 1 Tremont	23-9n-2e	March	Wilcox	2,528-34	2,779	72	19	Oil discovery; orig. field called Summerville.
Cypress Bayou, La Salle, H. R. Scivally, Tr. 1 Louisiana Delta	12-6n-4e	June	Wilcox	4,755-60	5,510	360	3	
Lowe, Caldwell, Big West Drlg. Co. 1 Lowe	SE SE 36-12n-3e	August	Wilcox	2,173-78	4,009	15,000,000 cu. ft.	1	
Trout Creek, La Salle, Scruggs & Todd 1 Pipes	NW NE 19-18n-3e	August	Wilcox	3,230-33	3,626	128	8	Sometimes called N. Nebo, 2 oil and 5 gas wells.
Lisbon Deep, Claiborne, Big West Drlg. 1 Alford	11-21n-4w	August	Pettit	5,098-5,112	6,209	2—80 bbl. dist. 5,000,000 cu. ft.	1	3 mi. northwest of Lisbon field.
Stack, De Soto, J. E. Stack 1 Cook	SW NE 32-13n-14w	September	Chalk	2,856-58	2,858	5 oil, 50 wtr.	2	
Larto Lake, Catahoula, Carter and Phillips 1-B Tensas	NE NE 14-5n-5e	September	Wilcox	5,110-32	6,004	154	2	
Hughes, La Salle, Delta Drlg. Co. 1 Hughes	NE SW 22-8n-1e	October	Eocene	1,462-65	4,092	10,000,000 cu. ft.	1	Plugged back from Wilcox.
Haynesville Deep, Claiborne, T. L. James 1 Aiken	NW SE 27-23n-8w	November	Pettit	5,431-40	5,853	288	2	
Willow Lake, Catahoula, Fisher and Phillips 1 Womack-Cotton	NW NE 12-6n-6e	December	Wilcox	5,533-37	6,810	175	2	
Rapides, Marr and Phillips 1 Eota Realty	SW NE 14-4n-3e	December	Wilcox	5,140-60	5,800	Still testing	1	
Catahoula Lake, La Salle, Carter Oil 1-D Tensas Land	SE SW 25-6n-3e	December	Wilcox	4,294-98	5,905	144	1	
ARKANSAS								
East Schuler, Union, Crescent Drilling Co. 1 Burns	13-18s-17w	June	Cotton Valley	5,542-5,546	7,702	132	5	Prod. horizon corresponds to Morgan sd. of Schuler.
El Dorado Deep, Union, C. H. Murphy C-1 Cates	33-18s-15w	June	Cotton Valley	6,023-6,027	7,820	144	4	New deep production.
Stephens Deep, Columbia, Fitzwater & McClerkin 1 Smart	14-15s-20w	June	Travis Peak	3,425-3,434	3,434	25	6	New deep production
Macedonia, Columbia, McLester Fuel Oil 1 Franks unit	SE SE 16-18n-21w	July	Smackover	8,906-14	8,981	329 dist. with gas	6	Gas and distillate.
Holly, Ouachita, Lee Bergman 2 Cook	NW SW 27-15n-18w	October	Nacatoch	1,614-16	1,616	50	2	Buffalo and West Smackover.
Patton, Lafayette, Tide Water-Seaboard 1 Moore	SW SE 29-17s-24w	November	Smackover	9,312-40	9,375	215 dist.	1	Gas and distillate.
Mount Holly, Union, Atlantic Ref. 1 Davis unit	NE NW 15-17s-18w	November	Smackover	7,166-68	7,373	251	1	38-gravity oil.
MISSISSIPPI								
Tinsley Deep, Yazoo, Union Producing Co. 2 Powell	NE SW 36-11n-3w	August	Eutaw	5,771-85	6,135	693	2	New pay in north end of Tinsley.
Cary, Sharkey, British American Oil 1-A Houston	NE SW 23-11n-7w	October	Selma	3,278-80	4,335	46 oil 120 water	1	21 miles west of Tinsley.
Pickens-Sharpsburg, Madison, Buzz Morgan 1 Johnny	SW SW 4-11n-3e	December	Eutaw	4,824-36½	5,663	443	1	2 miles southwest of Pickens.
EAST TEXAS BORDER								
Pickering, Shelby, Ce-Beth Oil Co. 1 Pickering Lbr. Co.	Patterson Sur.	October	Cretaceous	3,343	3,343	50	1	

PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
NORTH LOUISIANA														
Cotton Valley	5,279,013	14,463	431,524	380,822	418,666	393,629	341,911	453,299	493,053	472,748	469,673	476,628	474,462	481,598
Rodessa	5,271,269	14,442	488,274	444,629	459,752	468,882	459,435	450,219	434,165	434,158	410,847	407,819	404,406	408,683
Olla	424,495	11,623	270,336	265,828	312,504	306,289	347,997	361,221	352,471	377,728	388,647	413,386	409,817	436,271
Caddo	3,095,607	8,481	257,013	235,231	260,571	246,118	258,099	247,849	260,093	255,594	260,107	276,363	265,656	277,913
Homer	1,056,369	2,889	85,994	78,563	88,388	85,673	92,361	86,131	88,968	90,673	88,947	92,388	87,605	90,678
Cross Lake	1,024,995	2,808	98,270	84,700	88,350	80,850	83,235	81,750	86,647	87,891	86,543	81,836	82,043	82,877
Nebo	944,410	2,588	23,541	30,956	38,873	44,574	56,719	62,107	67,899	83,723	96,152	129,274	151,216	169,376
Haynesville	938,672	2,572	81,202	72,115	77,779	79,223	82,138	79,108	82,304	73,781	80,852	76,569	72,154	81,447
Lisbon	928,811	2,545	84,486	72,671	85,409	95,847	86,474	86,977	75,948	67,892	66,447	71,146	66,152	69,362
Sligo	820,436	2,248	64,192	56,402	58,140	58,649	62,333	61,603	68,822	80,296	76,656	78,743	75,316	79,284
Urania	817,494	2,240	68,324	63,583	70,668	71,903	74,071	66,981	68,208	72,074	68,248	65,565	64,048	63,821
Sugar Creek	518,939	1,422	37,525	34,689	47,763	49,638	52,568	47,331	37,822	39,059	46,047	43,098	40,652	42,837
Little Creek	412,706	1,131	.....	.....	934	6,754	14,268	18,747	32,084	40,309	46,217	73,468	84,603	95,322
Zwolle	412,328	1,130	40,633	34,288	39,858	37,031	35,666	34,543	35,031	32,708	29,554	30,386	31,949	30,681
De Soto-Red River	365,552	1,001	31,454	28,302	30,672	31,065	31,744	30,298	31,016	28,824	30,911	31,464	28,949	30,353
ARKANSAS														
Magnolia	7,117,752	19,500	617,489	552,883	610,223	586,073	615,951	603,586	611,165	609,773	591,613	584,356	562,948	571,602
Schuler	6,062,112	16,510	509,950	459,060	507,315	498,300	517,390	496,350	516,150	520,375	495,316	513,524	494,608	497,774
Smackover	5,353,547	14,393	562,054	507,489	564,222	554,232	574,600	551,494	572,724	579,428	554,263	570,106	538,751	553,652
Atlanta	1,007,186	2,759	76,522	72,123	83,836	84,166	86,303	85,359	89,900	86,334	85,956	86,814	81,943	87,930
McKamie	840,389	2,303	19,368	42,724	52,069	55,072	56,092	55,290	90,055	127,723	118,947	84,471	69,211	89,367
Urbana	828,857	2,270	57,210	47,849	52,723	56,388	61,868	58,666	71,143	83,392	82,517	84,783	86,847	85,271
Buckner	823,312	2,258	68,181	60,776	69,408	67,674	72,994	75,957	68,510	68,048	64,948	68,981	68,849	68,987
Dorcheat	672,331	1,568	41,856	42,706	52,088	55,054	56,113	54,609	54,405	67,888	70,794	53,628	62,861	60,329
Rodessa	507,391	1,390	49,926	45,118	51,639	43,639	47,762	43,612	39,680	42,007	34,958	36,117	36,451	36,482
El Dorado	478,993	1,312	48,838	43,691	47,744	45,297	44,469	44,272	34,890	34,251	36,593	33,947	30,288	34,713
Troy	428,955	1,173	35,167	30,255	31,124	34,523	31,298	31,073	31,774	32,237	36,319	46,653	43,519	45,013
Village	362,984	994	31,899	29,423	32,693	30,023	32,531	30,736	31,032	30,218	27,334	28,207	27,916	30,972
Macedonia	115,857	630	.....	.....	.....	.....	.....	.....	6,500	7,279	13,182	16,428	34,647	37,821
MISSISSIPPI														
Tinsley	15,564,042	42,751	526,056	537,089	551,937	784,136	894,336	1,047,382	1,461,437	1,553,395	1,632,465	1,966,306	2,221,501	2,387,942

an added handicap to initial exploration and subsequent development when production is found.

None of the wells yet completed in the Wilcox in this trend of play are the large gusher type, but rather are consistent 100 to 200-bbl. wells, with many making some water. This is due mainly to the nature of the producing formation and the difficulty encountered in cementing and completing the wells. There are at least 10 parishes in Central Louisiana which are now sharing the wildcat exploratory campaign and more new fields are all but inevitable.

Great extension activity is still in progress in the already partially developed fields in the district and much new proven acreage will be added during the coming year. Probably many of the fields will be joined by later drilling. Centering most of the activity and interest, however, will be the continued search for additional new fields, probably to the south of the present district.

Production from this Wilcox trend has already had a great effect on the total yearly production of North Louisiana, and during the coming year even a greater effect will be noticed. The yearly figure was almost 27,000,000 bbl. in 1941 or almost 3,000,000 bbl. above the 1940 figure. The Wilcox fields were responsible for about 5,000,000 bbl. last year. The 1942 totals will approximate 34,000,000 bbl., some 12,000,000 bbl. coming from the Wilcox fields of the district.

Destined to be responsible for a great deal of drilling during the coming year is the new Pettit lime level opened in the old Haynesville field of Claiborne Parish. The discovery well made 288 bbl. daily from 5,431-40 ft., while the second completion and a sizable extension made even a better well. As the year closed there were close to a dozen locations staked in the field. Drilling was being held up pending a field hearing to determine spacing and field drilling rules. Production had been developed in 1940 from several zones, of the Trinity series in both the Haynesville field and the Lisbon field to the southeast, but it had not stood up and was considered of little significance. The structural features of the deep zones have not yet been defined, however, based on the present knowledge, a sizable oil reservoir exists in this Pettit lime zone.

In March of the past year, Union Producing Co., after much testing, completed its 1-A Meadows for a discovery distillate well in the Lisbon area of Claiborne Parish. Significant was the fact that production was found in the Smackover lime at a depth of 10,148-10.398 ft. This greatly supported the belief that major oil reservoirs did exist in northern Louisiana in the Smackover lime level despite the fact that it was some 10,000 to 11,000 ft. below the surface.

As the year closed the discovery company was drilling below 10,000 ft. at its second test in the area, an 1,800-ft. outpost to the discovery well. Should this spot prove productive over any broad area, it would greatly increase the wildcat search for similar deep production throughout several North Louisiana parishes.

Smackover Lime Development Most Important Arkansas Activity

The center of the development in Arkansas during 1941 was the continued search for new Smackover lime fields, as well as development of existing fields, throughout the southernmost tier of counties in the state. The development of vast Smackover lime gas reserves marked the greatest degree of activity, as two new such gas fields were opened and two other undeveloped areas received a great amount of drilling. Only one new Smackover lime oil field was opened during the year and it did not appear too promising as the year closed.

The deep lime gas discoveries included Macedonia in Columbia County, opened in July, and the Patton field in Lafayette County, opened in November. The oil discovery was the Mount Holly field, Union County, which embraced only the discovery well as the year closed. One other test was attempting completion but was bothered with excessive water in the producing formation.

The McKamie, Dorcheat and Macedonia gas fields received a total of 17 gas and distillate wells during the year, which added several hundred proven acres to each of the three fields. Probably most significant concerning this gas development is the fact that markets have been furnished by industrial plants in the area, thus increased attention is being given to the need for sweetening this extremely sour gas so that it will be commercially usable. Dorcheat is both a gas and an oil-producing field, Macedonia is mainly a gas field, while McKamie is the largest gas reserve of the district. One large desulfurization plant is now being constructed in this latter field for sweetening the gas, and additional plants are believed likely for the other gas fields as the need for additional fuel increases with the industrial development.

The discovery of the Patton field in western Lafayette County almost proved the theory that the farther west and the farther downdip Smackover lime production was encountered, the greater would be the sulfur and carbon dioxide gas content of the petroleum products found. The Patton field is the deepest and also the closest to the broken fault zone running northwest through Miller County and across northern Lafayette County. This fact was further proven the early part of 1942 by a promising oil discov-

NORTH LOUISIANA

Summary of Wells Completed During 1941

Field—	Comp.	Oil	I.P.	Gas	Dry
Ajax	4	2	10	1	1
Athens	2	0	0	1	1
Bethany	1	0	0	0	1
Bellevue	31	22	404	1	8
Bisteneau	4	0	0	4	0
Blue Lake	1	1	60	0	0
Bull Canyon	1	0	0	0	1
Caddo	186	163	9,211	1	22
Carterville	1	1	25	0	0
Converse	10	2	60	0	8
Cotton Valley	7	4	2,212	2	1
Cypress Bayou	4	2	538	0	2
De Soto	6	1	5	0	5
Greenwood	2	0	0	1	1
Haynesville Deep	1	1	667	0	0
Hemphill (and Nebo)	1	1	135	0	0
Homer	7	7	217	0	0
Joaquin	6	0	0	6	0
Kelly	2	0	0	0	2
Lisbon	7	0	0	4	3
Larto Lake	2	0	0	0	2
Little Creek	51	45	6,050	4	2
Logansport	2	0	0	2	0
Monroe	48	0	0	48	0
Nebo	87	71	10,872	0	16
Olla	108	92	12,581	4	12
Pleasant Hill	3	2	17	0	1
Sibley	3	0	0	2	1
Simsboro	1	0	0	0	1
Sligo	24	17	1,792	3	4
South Olla	19	10	910	0	9
Standard	2	0	0	1	1
Sugar Creek	14	5	2,158	4	5
Trout Creek	6	2	335	1	3
Urania	17	9	399	0	8
Waskom	1	0	0	1	0
Willow Lake	1	1	142	0	0
Zwolle	5	1	98	0	4
Wildcats	111	5	637	2	104
Miscellaneous fields	3	0	0	0	3
Total 1941	792	467	49,533	93	232

ARKANSAS

Summary of Wells Completed During 1941

Field—	Comp.	Oil	I.P.	Gas	Dry
Alma	1	0	0	1	0
Atlantic	5	5	2,747	0	0
Buckner	4	4	543	0	0
Champagnolle	2	0	0	0	2
Columbia	2	1	275	0	1
Dorcheat	10	8	3,047	2	0
East Schuler	5	4	804	0	1
East El Dorado	1	1	28	0	0
El Dorado	9	5	950	0	4
Fouke	9	5	1,479	0	4
Macedonia	6	2	688	4	0
Magnolia	2	1	650	0	1
McKamie	13	1	384	11	1
Mount Holly (old)	2	1	45	0	1
Nick Springs	4	2	400	0	2
Smackover	26	14	973	0	12
Stephens	14	10	1,060	0	4
Troy	15	13	640	0	2
Urbana	22	15	2,198	2	5
Village	1	1	720	0	0
Wildcats	44	2	466	0	42
Miscellaneous fields	1	0	0	0	1
Total 1941	198	95	18,095	20	83

PRODUCTION, 1937-1941

NORTH LOUISIANA

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Bellevue	280,405	239,959	209,787	181,514	218,924	111	147	170
Caddo	2,363,804	2,365,656	2,572,400	2,798,950	3,095,607	1,164	1,465	1 629
Converse	281,566	201,872	190,459	191,500	177,777	80	82	84
Cotton Valley	1,049,306	3,364,843	4,324,957	5,161,078	5,279,013	72	168	174
Cross Lake		113,322	1,875,193	1,554,219	1,024,995	.....	50	50
De Soto-Red River	537,818	499,414	412,101	371,170	365,552	167	129	130
Elm Grove	135,859	123,776	99,449	112,446	109,711	36	36	36
Haynesville	1,163,625	1,099,960	1,038,916	984,571	938,672	325	284	284
Holly	44,821	31,519	29,597	27,820	31,120	7	4	4
Homer	921,175	950,638	944,672	1,017,796	1,056,369	364	349	356
Larto Lake	.....	.....	.....	.....	10,897	.....	.....	2
Lisbon	2,377,724	3,334,868	1,708,190	1,521,444	928,811	.....	212	212
Little Creek	.....	.....	.....	.....	412,706	.....	.....	49
Nebo	.....	.....	.....	50,739	944,410	.....	7	78
Olla	.....	.....	.....	982,363	4,242,495	.....	93	189
Pleasant Hill	46,712	38,884	34,772	33,636	32,353	32	29	31
Rodessa	17,751,568	13,595,344	9,200,443	6,947,417	5,271,269	277	444	444
Sarepta district	127,851	137,151	153,058	115,716	87,977	55	30	31
Sligo	126,217	331,247	426,954	725,175	820,436	2	35	55
South Olla	.....	.....	.....	.....	48,127	.....	.....	10
Sugar Creek	88,017	114,987	122,170	208,489	518,939	.....	20	29
Cypress Bayou	.....	.....	.....	.....	44,744	.....	.....	2
Urania	1,022,398	1,016,338	969,888	898,570	817,494	213	272	281
Zwolle	274,857	781,670	954,702	617,962	412,328	63	60	61
Total	28,593,723	28,341,448	25,317,698	24,502,575	26,890,756	2,968	3,916	4,391
Daily average	78,339	77,647	69,363	66,947	73,672	.....	.....	.....
ARKANSAS								
Atlanta	.....	.....	107,588	732,204	1,007,186	.....	16	21
Big Creek	.....	.....	.....	24,956	42,009	.....	1	1
Buckner	6,045	337,577	678,214	822,740	823,312	.....	23	27
Champagnolle	549,103	453,793	552,084	430,539	337,208	84	79	79
Dorcheat	.....	.....	40,285	413,789	672,331	.....	8	18
East Schuler	.....	.....	.....	.....	40,138	.....	.....	4
East El Dorado	.....	.....	.....	.....	105,154	.....	.....	1
El Dorado	724,828	670,843	615,910	610,637	478,993	283	255	270
Fouke	.....	.....	.....	45,891	149,540	.....	2	7
Lewisville	.....	.....	135,226	242,685	104,880	.....	18	18
Lisbon	103,148	98,395	90,255	79,734	67,971	142	136	136
Macedonia	.....	.....	.....	.....	115,857	.....	.....	6
Magnolia	.....	107,199	3,589,627	7,402,317	7,117,752	.....	115	116
McKamie	.....	.....	.....	71,353	840,389	.....	3	16
Miller County	177,163	136,179	112,852	102,644	81,226	23	15	15
Mount Holly	.....	.....	.....	.....	11,942	.....	.....	1
Nevada	274,590	235,145	213,903	206,387	229,189	73	74	74
Nick Springs	.....	.....	.....	183,139	315,693	.....	12	14
Patton	.....	.....	.....	.....	18,088	.....	.....	1
Rodessa	1,275,940	2,436,425	1,431,646	716,230	507,391	.....	77	77
Schuler	1,197,090	6,193,314	6,421,056	6,609,747	6,026,112	.....	174	174
Smackover	6,917,458	6,543,419	6,084,346	5,628,013	5,354,547	1,809	1,605	1,619
Stephens	210,150	202,074	196,038	195,544	243,383	187	198	208
Troy	269,924	437,287	406,895	452,250	428,955	4	31	44
Urbana	475,638	438,194	385,570	481,896	828,657	30	52	67
Village	.....	67,291	303,493	418,012	362,984	.....	12	13
Total	12,181,083	18,357,235	21,364,988	25,870,707	32,336,499	2,635	2,906	3,027
Daily average	33,373	50,294	58,524	70,684	87,991	.....	.....	.....

ery from the Smackover north of this fault zone.

It appears to be free of sulfur compounds, and of the high gas volumes of wells below the fault zone.

Undoubtedly the coming year will bring an intensified search for both oil and gas fields throughout Lafayette County and on both sides of this fault system. Until the close of the year this fault was not recognized as having any great bearing on the type, chemical content, and magnitude of the Smackover lime petroleum discoveries of the district, but it is now thought to be of prime importance.

Pickens-Sharpsburg Discovery Only Important Mississippi Find

For the past few years Mississippi's oil activity has consisted of developing the vast Tinsley field and continually searching for additional fields throughout virtually all parts of the state. This search brought results during the past year, the latter half of the year mainly. Two new oil areas were opened to production, one being small and undeveloped and not offering very great promise, while the other appears to be a discovery of major importance. Not only were these two wildcat strikes credited to the past year, but also the opening of several new deep zones of production in the Tinsley field itself.

In Sharkey County and on what is termed the Sharkey Platform, British American Oil Producing Co. opened the Cary field in October. The discovery well was small and produced a great excess of water, thus there has been no subsequent development. In December the Pickens-Sharpsburg field was opened to production from the deep Eutaw level in Madison County and just south of the shallow Pickens field. The discovery well was completed with a relatively large water-free initial potential and development activities were immediately started in the area. As the year closed several tests were drilling in the vicinity of the strike. Should these extend the proven area, rapid and extensive activity will follow for this field during the coming year.

The Tinsley field was consistently extended to the south and southeast during the first half of the year, while the second half year brought most of the development to the north end of the field. There are now some seven separate producing zones in the north end of the Tinsley field, the discovery of which has materially added to the vast reserve of the big field. These zones are the Woodruff, Perry, Slick, Stephens, Lammons, McGraw, and Powell sands. They are lenticular and spotted in nature and have not been encountered consistently by all deep tests in the field. A great deal of the work during the coming year will be in the nature of exploring these deeper sands.

MISSISSIPPI

Summary of Wells Completed During 1941

Field—	Comp.	Oil	I.P.	Gas	Dry
Jackson	4	0	0	4	0
Tinsley	239	217	128,592	0	22
Wildcats*	39	2	489	0	37
Total 1941	282	219	129,081	4	59

*Wildcat discoveries: Cary field, Sharkey County; Pickens-Sharpsburg field, Madison County.

EAST TEXAS BORDER

Summary of Wells Completed During 1941

Field—	Comp.	Oil	I.P.	Gas	Dry
Bethany	2	0	0	2	0
Caddo	3	1	10	0	2
Carthage	2	0	0	2	0
East Carthage	1	0	0	1	0
Joaquin-Logansport	7	0	0	7	0
Smithland	22	14	753	0	8
Waskom	2	0	0	2	0
Wildcats	17	1	50	0	16
Total 1041	56	16	813	14	26

SOUTHEASTERN STATES

Summary of Wells Completed During 1941

	Comp.	Oil	Gas	Dry	Footage
Alabama	9	0	0	9	20,045
Georgia	1	0	0	1	1,501
Florida	1	0	0	1	1,280

West Central Texas Fields

(Continued from Page 133)

the wildcats failed to open deeper production.

In the southwestern portion of Jones County a trend of Cisco producing fields was established, consisting of the Akard, East Wimberly and Wimberly, Stith and Noodle Creek fields. All of these but the Wimberly pools had been discovered prior to 1941, but due largely to the success operators had in establishing multiple pays in the Wimberly pools the other fields received more attention. In Akard a total of 18 new producers were added during the year while 8 were added in Stith and Noodle Creek. In the Wimberly pools, in which production is being obtained from six pay zones, 10 new producers were added. Also as a result of this trend, the Merkel field was opened just south of Wimberly in Taylor County.

Stephens and Coleman counties this year received more attention than in past years, with the result that two Strawn pools were added in Coleman and a deeper pay and two gas areas in Stephens. The two Coleman discoveries were in the vicinity of the Novice field on the western side of the county. From initial development it appears that they will follow the same general northeast-southwest trend as the Novice field, although both are producing from the Strawn sand 150 ft. lower in the section.

Due to the need for gas to supply the large Army camps at Brownwood, Abilene and Mineral Wells, operators devoted more attention to the discovery and development of gas production. Eight of the discoveries were gas strikes and in addition more drilling was done in the established gas areas of Brown, Coleman and Palo Pinto counties.

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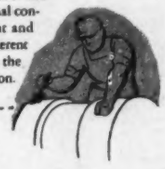

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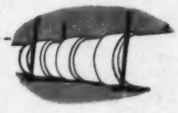

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UNARCO

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INTENSE WILDCATTING YIELDS MANY NEW FIELDS AND ADDITIONAL PAYS

MATTOON, Ill.—Faced with declining production and an increased demand for crude, Illinois operators undertook a more extensive search for new oil pools during 1041 than at any other time in the state's history. The continuous wildcatting campaign resulted not only in the discovery of more new productive areas than during any other year in the state but also in the discovery of many new pay horizons and extensions for the existing fields. Approximately 40 per cent of the fields which have been discovered in Illinois since January 1, 1937, were opened during the past year. Although a total of 3,838 tests was completed during the year, an increase of 24 over the previous year, the number completed as oil wells amounted to only 2,925, this was 124 fewer than in 1940.

Production continued on a fairly even keel until May and then rose from 320,000 bbl. daily to over 400,000 bbl. daily in November Total pro-

(Continued on Page 145)

DISCOVERIES IN ILLINOIS DURING 1941

Pool and county	Well	Location	Production (bbl.) and sand	Depth (ft.)	Date completed
Allendale, Wabash	Joe Young 6 Stilwell	600 ft. NL, 1,520 ft. EL, SE 1-1n-12w	P 250, Benoist	2,011-21	1- 7-41
Dahlgren, Hamilton	Dick Duncan 1 Zella	SE NE NE 34-3s-5e	P 132, McClosky	3,337-59	1-14-41
Benton, Franklin	E. S. Adkins 1 Orient Coal Co.	NE SW SE 24-6s-2e	F 397, Tar Springs sand	2,112-48	1-21-41
South New Harmony, White	F. H. Rhodes 1 Golden	SW SE NE 29-5s-14w	P 112, Waltersburg sand	2,254-82	1-28-41
East Patoka, Marion	Obering & Phillips 1 Thompson	NW NW NW 35-4n-1e	P 84, Weiler	1,349-59	1-28-41
South Herald, White	Mabee 1 Knight	SW SW SE 10-7s-9e	P 120, Tar Springs sand	2,254-66	2- 4-41
Bone Gap, Edwards	Tide Water 1 Gawthrop	NE NE NE 13-1s-10e	P 46 oil and 85 water, McClosky	3,266-78	2- 4-41
West Frankfort, Franklin	E. S. Adkins 1-B Orient Coal Co.	SE NE NW 12-7s-2e	P 31 oil and 66 water, Tar Springs	2,054-68	2-25-41
Bungay, Hamilton	Woodriver Dev. Co. 1 Walker	SW NE NW 26-4s-7e	P 41, 20% water, Aux Vases	3,275-90	3- 4-41
East Boyleston, Wayne	Watkins 1 Reffler	N½ SE SE 35-1s-7e	P 128, McClosky	3,316-35	3-11-41
New Haven, White	Hiawatha 1 Stenson (formerly Benedum-Trees)	SW SW NE 19-7s-11e	P 107, Tar Springs	2,118-29	3-25-41
Posey pool, Clinton	J. F. Ashoff 1 Lampon	315 ft. NL, 160 ft. WL, NW NW NW 16-1n-2w	P 29 oil and 1 water, Weiler	1,101-10	4- 1-41
Maunie pool, White	Ralph Halbert 1-A Hubele	330 ft. NL, 1,050 ft. L, SW 7-6s-11e	P 20, Palestine sand	2,012-18	4- 8-41
Lakewood, Shelby	W. H. Sloan 1 Cutler	150 ft. SL, 150 ft. EL, SE NE 12-10n-2e	P 37, Aux Vases	1,723-35	4-29-41
Rising Sun, White	Cherry & Kidd 1 Karch	SW NW NE 24-6s-10e	P 158, Aux Vases	2,840-65	5-13-41
Ellery, Edwards	Bruce Martin 1 Lester	W½ SW SW 19-2s-10e	P 127 fluid (60% b.s.&w.), McClosky	3,340-48	5-13-41
Bonpas, Richland	Paul Osborn 1 Bowers	SW SW SE 34-3n-14w	P 240 oil and 50 water, McClosky	3,118-29	5-27-41
West Francisville, Lawrence	C. E. Everts 1 Catt	SW SE SW 23-2n-12w	P 25, sand	1,379-97	
South Dix, Jefferson	Clark Nye 1 Sargent	SW SW NW 22-1s-2e	P 63 in 23 hours, Bethel	1,931-36	5-27-41
Sailor Springs, Clay	Carl Robinson et al 1 Tolliver	SW NW SE 26-4n-7e	P 254 plus 6% salt wtr., Tar Spgs.	2,327-41	6- 3-41
North Maunie, White	Continental 1 Ackermann	NE NW NE 25-5s-10e	P 20, McClosky	3,097	6-10-41
Elkville, Jackson	Wiser 1 Overholt	SE SW 22-7s-11w	P 5 oil, 1 water, Bethel	2,000-2,028	6-10-41
Walpole, Hamilton	J. Chevigney 1 H. H. Phillips	SW NW SW 26-6s-6e	P 53 oil, 55 water, Aux Vases	3,053-3,193	7- 1-41
North Inman, Gallatin	Blackstock et al 1 Cox	NE NW SW 2-8s-9e	P 40 oil, McClosky		7-15-41
Johnsonville, Wayne	Wiser 1 Hillard	S½ SE SW 27-1n-6e	F 2,406 oil, McClosky	2,992-3,085	7-15-41
Woodlawn, Jefferson	Kingwood 1 First National Bank	SE NE SW 35-2s-1e	S 955 oil, Bethel	1,941-1,960	7-22-41
West Bonpas, Richland	C. R. Craft 1 Daubs	E½ SW NE 8-2n-14w	F 940 oil, McClosky	3,144-3,171	8-26-41
Eldorado, Saline	Thompson Drilling Co. 1 J. Reich	NE SW NE 8-8s-7e	P 92 oil, 14 water, McClosky	2,943-2,998	8-26-41
West Grayville, White	Wall-Mitchell 1 Kershaw	SW SW NE 22-3s-10e	P 53 oil, Weiler	2,853-2,897	8- 5-41
Jeff, Wayne	Pure 1-A Johnson	W½ SE NE 12-1s-7e	P 62 oil, 134 water, McClosky	3,135-3,180	8-19-41
Mayberry, Wayne	Texas Co. 1 F. N. Draper	W½ NW SW 8-3s-6e	P 75 oil, McClosky	3,352-3,380	8-26-41
Parkersburg, Richland	Ohio 1 Koertge	617 ft. EL, 336 ft. SL, NW 29-2n-14w	F 1,459 oil, McClosky	3,117-3,129	8-19-41
Rural Hill, Hamilton	Shell 1 Ventrees	SW SW SE 12-6s-5e	F 794 oil, Levias		8- 5-41
Sailor Springs, Clay	McBride 1 Drake	SE SW NE 34-4n-7e	P 48 oil, 9 water, Cypress	2,581-2,610	8-26-41
Alma, Marion	Swan-King 1 Kotva heirs	264 ft. SL, 610 ft. WL, NW 36-4n-2e	P 439, Rosiclare	2,070	9-23-41
North Benton, Franklin	Mohawk Drlg. 1 Stuart	NE 11-6s-2e	P 308, Rosiclare	2,794	9-16-41
Boulder, Clinton	Texas 1 Price Gray	S½ NW SE 35-3n-2w	117.5, Devonian	2,570	9-30-41
East Centerville, White	Yingling et al 1 Shepard	NE NE NE 5-4s-10e	P 60, Weiler	2,887	9- 9-41
Euworth, White	W. F. Catlett 1 Calvert	SE SE NW 32-5s-10e	P 90, Palestine	2,099	9- 9-41
St. Paul, Fayette	Luttrell 1 Ford	NE NE NW 31-5n-3e	P 41, Bethel	1,876	10-14-41
East St. Francesville, Lawrence	Sinclair-Wyoming 1 All States Life	292 ft. EL, 330 ft. SL, SE SE NW 22-2n-11w	P 40, Bethel	1,747	10-21-41
Ruark, Lawrence	DeKalb 1 J. King	S½ SW NE 8-2n-12w	P 57, Buchanan	1,514	10-21-41
Simms, Wayne	Bell Bros. 1 Fuhrer	W½ NE NW 33-1s-6e	P 240, McClosky	3,158	11- 4-41
Stringtown, Richland	Wolf et al 1 Nuding	NW SW NW 6-4n-14w	P 190, McClosky	3,028	11-11-41
Xenia, Clay	Carter 1 A. M. Keller	W½ SW SW 4-2n-5e	P 44, Aux Vases	2,786	11-25-41
Ste. Marie, Jasper	Craft & Powers 1 C. Wade	W½ SW NW 5-5n-14w	F 500, McClosky	2,832	11-25-41
Patton, Wabash	H. Fotiades 1 L. Mason	SW SE NW 27-1n-12w	P 170, McClosky	2,309	11-18-41
Clay City West, Clay	B. F. Williams 1 M. E. Nolan	S½ SE NW 10-2n-7e	F 3,608, McClosky	3,070	12- 9-41
Cook's Mills, Coles	Carter 1 W. H. Haybrook	E½ SE SW 2-13n-7e	P 30 oil, 2 water, Aux Vases	1,830	12- 9-41
Carlinville North, Macoupin	F. Mudgett 1 Golbert	670 ft. NL, 402 ft. WL, NE SE 20-10n-7w	P 10, Pottsville	436	12- 2-41

PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

ILLINOIS

Fields—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Salem	29,533,803	80,915	3,310,384	2,847,599	3,072,754	2,799,587	2,754,887	2,515,172	2,406,585	2,288,256	2,085,590	1,953,264	1,777,799	1,721,926
Louden	22,918,346	62,790	2,127,579	1,907,719	2,035,626	1,956,992	1,962,713	1,845,654	1,909,872	1,883,501	1,805,903	1,882,013	1,869,912	1,830,862
New Harmony	9,939,094	27,230	600,394	607,791	745,418	796,150	882,310	890,277	922,411	978,323	915,429	931,437	867,710	801,474
Johnsonville	5,912,913	32,400							77,915	672,005	1,406,558	1,446,297	1,450,716	1,256,422
Benton	5,789,032	15,806	9,642	23,056	53,343	172,384	465,166	613,160	732,522	808,067	767,464	751,256	708,652	664,320
Clay City	4,679,581	12,821	498,640	429,616	446,003	407,294	493,812	384,868	395,350	303,590	354,340	341,260	324,387	300,421
Dundas	4,437,860	12,159	376,031	285,213	367,223	373,517	421,257	402,849	426,452	372,701	331,518	349,182	327,585	304,327
Hoodville	3,712,422	10,171	228,225	293,737	400,465	386,637	366,334	365,576	310,255	347,116	300,642	273,250	232,825	207,360
Centralia	3,564,381	9,765	400,784	338,315	361,033	326,141	320,144	304,474	279,974	169,911	255,506	253,477	233,866	220,697
Noble	2,506,994	6,868	212,730	194,469	218,352	204,359	218,957	215,472	214,815	215,558	211,375	210,511	196,125	183,271
Dale	2,483,462	6,804	43,145	38,431	42,588	39,380	60,105	111,579	250,752	415,580	424,679	408,344	344,064	304,815
Woodlawn	2,464,823	6,753	1,413	1,401	2,550	3,625	2,470	2,231	22,954	259,046	452,749	681,637	586,091	538,656
Bridgeport	2,092,074	5,732	164,935	139,077	159,778	174,784	182,076	186,741	172,199	174,911	185,310	192,102	175,841	184,320
Keensburg-Griffin	2,002,277	5,486	243,071	195,753	196,278	172,718	175,478	167,861	164,451	172,584	167,902	171,306	172,463	173,815
St. James	1,870,869	5,126	182,025	166,926	173,542	172,187	172,919	166,057	166,978	162,492	155,398	158,917	143,417	149,984
Mount Carmel	1,690,955	4,633	38,534	57,654	112,334	146,512	148,341	161,370	167,065	196,534	186,510	167,854	159,927	148,320
Rural Hill	1,570,185	8,534							399	39,588	143,482	291,803	473,073	621,840
Robinson-Stoy	1,412,923	3,871	113,564	108,800	116,968	125,565	123,280	113,186	123,309	113,772	115,106	123,965	108,495	116,913
Storms	1,397,607	3,747	146,661	133,268	148,993	141,766	128,320	110,440	106,108	104,585	101,805	99,835	91,464	84,362
Tonti	1,250,363	3,426	135,001	111,921	106,010	111,556	106,084	115,616	112,018	104,585	95,741	92,524	82,979	76,328
Roland	1,101,050	3,017	240	98	306	1,646	1,196	27,945	98,042	169,673	196,982	199,065	193,519	212,338
Irvington	1,036,798	2,841	87,789	76,522	85,489	83,551	85,406	88,860	99,361	100,050	91,951	86,500	78,995	72,364
Mill Shoals	925,380	2,535	92,994	80,209	77,944	66,691	69,387	60,026	52,856	52,021	62,490	86,830	106,875	118,327
Albion	895,165	2,453	98,029	79,494	80,901	63,561	63,650	66,023	77,596	105,400	74,314	73,979	60,088	52,130
North Boos	825,621	2,262	25,865	29,074	32,334	33,394	38,075	43,057	72,630	111,511	102,902	119,317	111,175	106,347
Boyleston	815,472	2,234	102,909	73,934	80,855	62,729	60,996	60,510	52,490	54,142	70,893	76,343	63,411	57,260
Iron	800,720	2,194	80,535	67,209	75,715	70,179	68,882	70,460	68,740	69,075	63,446	63,244	53,711	48,712
Aden and North	800,302	2,193	90,688	76,218	79,697	68,197	57,340	53,324	49,186	46,715	44,049	44,300	40,774	40,832
Parkersburg	785,012	5,131								17,953	44,581	209,830	226,328	286,320
Dix	786,684	2,155	56,665	48,347	55,582	54,867	56,058	64,191	76,098	73,983	71,012	73,186	69,268	67,248
Dahigren	680,621	1,865	3,878	6,841	23,930	46,382	107,847	133,447	115,356	87,419	58,218	41,487	29,095	26,812
East Patoka	658,537	1,804	539	2,916	20,880	34,201	50,663	75,329	86,690	84,506	81,413	79,183	73,720	68,497
Cordes	532,161	1,458	49,761	46,081	47,680	47,504	46,764	44,344	47,160	42,896	45,005	42,291	37,479	35,196
Inman and North	462,199	1,266	1,427	1,120	485	10,131	42,914	60,054	61,540	67,045	60,458	55,334	51,228	49,483
Sandoval	449,106	1,230	44,120	40,380	42,835	40,539	43,940	41,610	37,141	36,808	32,442	31,372	29,500	27,419
Patoka	417,778	1,145	30,996	27,557	33,600	33,919	34,431	35,506	38,703	39,467	35,942	36,860	34,468	36,329
Casey	394,073	1,080	34,663	29,433	32,205	34,295	34,949	34,168	33,766	31,600	32,324	34,247	29,608	32,815
Maunee South	371,179	2,017							27,608	56,829	60,195	79,482	75,739	71,326

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When we say WEDGE Thread Protectors will give you MAXIMUM protection, we mean just that! The reason we make this claim is because of proven exclusive patented features, without which it is impossible to get the protection we give. Damaged threads often cause serious and costly delays—avoid this by specifying WEDGE Thread Protectors on each pipe order.

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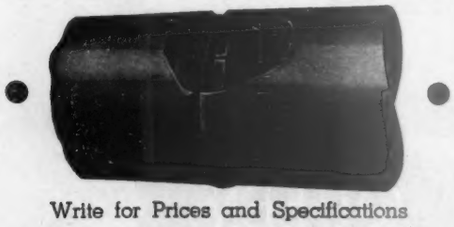
You can lay your line with greater SPEED when you use WEDGE Chill Rings with the patented SPLIT Feature. They are FLEXIBLE and will adjust themselves TIGHTLY to the irregular diameter of unfinished inside surfaces of pipe. Skilled help can weld FASTER, and even less skillful help can do better.



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Don't worry—use NO-CO-RO—the first non-corrosive steel ball & seat and drop & seat.

Manufactured only by

NORRIS BROTHERS, INC.

ROBINSON, ILLINOIS

ILLINOIS PRODUCTION, 1937-1941

						Number of wells		
Bond County:	1937	1938	1939	1940	1941	1-1-37	1-1-41	1-1-42
Woburn	.....	.....	.....	94,319	161,143	.....	24	27
Clay County:								
Clay City	1,556,260	4,004,751	7,693,962	6,922,027	4,679,581	80	588	679
Flora and East	.....	68,140	147,462	95,187	75,814	.....	19	18
Sailor Springs	.....	.....	.....	.....	157,945	.....	.....	25
Total	1,556,260	4,072,891	7,846,354	7,020,574	4,917,556	80	608	726
Clinton County:								
Bartelso	51,175	161,870	107,063	376,760	255,727	9	60	64
Carlyle	27,818	27,220	29,011	28,995	45,227	88	78	103
Centralia	4,985	3,022,020	2,265,450	10,641,870	3,564,381	3	883	707
Hoffman	.....	.....	.....	112,920	148,949	.....	40	44
Wamac	19,750	9,780	21,000	19,000	16,695	46	36	36
Total	103,728	3,220,890	2,422,524	11,179,545	4,032,875	146	1,078	1,046
Edwards County:								
Albion	.....	.....	.....	1,095,450	895,165	.....	55	79
Bone Gap	.....	.....	.....	.....	63,891	.....	.....	4
Cowling	.....	.....	22,742	52,549	59,087	.....	13	12
Grayville	.....	.....	25,904	65,870	40,201	.....	7	4
Ellery	.....	.....	.....	.....	12,952	.....	.....	2
Total	.....	.....	48,646	1,213,869	1,071,296	.....	75	101
Effingham County:								
Mason	.....	.....	.....	3,685	145,155	.....	1	17
Fayette County:								
Louden	.....	1,891,855	18,350,888	26,595,650	22,918,346	.....	1,755	1,911
St. James	.....	48,164	438,571	1,713,141	1,870,869	.....	173	182
Total	.....	1,940,019	18,789,459	28,308,791	24,789,215	.....	1,928	2,093
Franklin County:								
Benton	.....	.....	.....	.....	5,769,032	.....	.....	222
Thompsonville	.....	.....	.....	79,266	117,187	.....	16	18
Benton, North	.....	.....	.....	.....	22,721	.....	.....	6
Total	.....	.....	3,664	86,309	5,914,040	.....	17	247
Gallatin County:								
Inman and N.	.....	.....	.....	3,518	462,199	.....	3	47
Junction	.....	.....	21,281	103,324	44,767	.....	14	14
Omaha	.....	.....	.....	11,798	330,711	.....	1	20
Total	.....	.....	21,281	118,640	837,677	.....	18	81
Hamilton County:								
Belle Prairie	.....	.....	.....	2,731	31,731	.....	1	2
Rural Hill	.....	.....	.....	.....	1,570,185	.....	.....	94
Walpole	.....	.....	.....	.....	209,541	.....	.....	25
Dahlgren	.....	.....	.....	.....	680,621	.....	.....	42
Dale	.....	.....	.....	314,186	2,483,462	.....	25	125
Hoodville	.....	.....	.....	352,760	3,712,422	.....	52	155
Total	.....	.....	.....	669,677	8,714,154	.....	78	444
Jasper County:								
N. Boos	.....	.....	.....	249,262	825,621	.....	9	44
Total	.....	.....	.....	249,262	826,464	.....	9	45
Jefferson County:								
Cravat	.....	.....	9,591	66,404	67,954	.....	11	11
Dix	.....	.....	704,566	717,517	786,684	.....	65	76
Roaches	.....	.....	72,321	174,664	93,685	.....	11	10
Woodlawn	.....	.....	.....	.....	2,464,823	.....	1	137
Total	.....	.....	799,946	963,977	3,395,567	.....	90	236
Marion County:								
Fairman	.....	.....	14,864	206,779	309,305	.....	16	24
Patoka	425,000	742,022	492,442	418,521	417,728	93	106	114
Patoka, E.	.....	.....	.....	.....	658,537	.....	.....	56
Salem	.....	2,894,963	50,179,090	70,734,313	29,538,803	.....	2,398	2,379
Sandoval	23,786	15,000	695,888	704,360	449,106	45	48	49
Tonti	.....	.....	834,574	2,556,475	1,250,363	.....	53	56
Total	448,786	3,651,985	52,216,867	74,620,448	32,630,387	138	2,664	2,678
McDonough County:								
Plymouth-Colmar	147,809	128,170	136,245	121,535	113,533	196	210	216
Richland County:								
Dundas	.....	.....	209,076	2,340,984	4,437,860	.....	127	233
Noble	947,340	4,232,315	1,643,801	2,743,968	2,506,894	.....	237	238
Olney	565	414,083	327,978	210,335	143,503	.....	40	34
Schnell	.....	.....	46,167	21,667	13,605	.....	4	4
Bonpas and W.	.....	.....	.....	.....	67,627	.....	.....	5
Parkersburg	.....	.....	.....	.....	785,012	.....	.....	1
Stringtown	.....	.....	.....	.....	14,147	.....	.....	3
Total	947,905	4,646,398	2,227,022	5,316,954	7,975,093	.....	408	524
St. Clair County:								
Dupo	33,175	36,095	146,076	181,818	289,234	45	64	72
Shelby County:								
Lakewood	.....	.....	.....	.....	7,891	.....	0	2
Stewardson	.....	.....	3,571	6,741	11,269	.....	3	3
Total	.....	.....	3,571	6,741	19,160	.....	3	5
Wabash County:								
Keensburg	.....	.....	987,083	2,708,949	2,002,277	.....	262	298
Lancaster	.....	.....	.....	343,648	99,399	.....	29	23
Linn	.....	.....	.....	11,071	89,580	.....	5	10
Maud	.....	.....	.....	46,995	158,985	.....	9	18
Mount Carmel	.....	.....	.....	25,809	1,690,955	.....	7	186
Total	.....	.....	987,083	3,236,472	4,131,067	.....	312	535
Washington County:								
Cordes	.....	.....	447,843	714,064	532,161	.....	128	128
Dubois	.....	.....	471	18,667	34,872	.....	4	9
Irvington	.....	.....	.....	509,458	1,036,798	.....	39	74
McKinley	.....	.....	.....	.....	83,667	.....	1	6
Total	.....	.....	448,314	1,242,190	1,687,498	.....	172	217
Wayne County:								
Aden and N	.....	305,096	794,055	1,009,008	700,302	.....	73	70
Barnhill	.....	.....	563,380	646,375	230,964	.....	63	63
Boyleston	.....	.....	169,101	1,305,780	815,472	.....	88	100
Clay	20,483	420,575	1,223,587	478,752	219,002	.....	47	45
Johnsonville	.....	.....	.....	.....	5,912,913	.....	0	217
Keen	.....	.....	101,283	127,817	69,834	.....	15	14
Sims and N.	.....	.....	.....	.....	11,914	.....	.....	4
Total	20 483	726,671	2,857,682	3,570,975	7,963,705	.....	290	518
White County:								
Burnt Prairie	.....	.....	.....	143,639	109,025	.....	18	20
Centerville and E.	.....	.....	.....	48,835	75,030	.....	3	11
Herald	.....	.....	.....	3,414	19,812	.....	3	5
Iron	.....	.....	.....	1,119,875	800,720	.....	46	64
Maunie South	.....	.....	.....	.....	371,179	.....	.....	52
New Harmony	.....	.....	5,878	1,503,036	9,939,094	.....	206	645
New Harmony S.	.....	.....	.....	.....	23,841	.....	0	4
New Haven	.....	.....	.....	.....	171,552	.....	0	19

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duction was 128,630,909 bbl. for the year as compared to 146,450,876 bbl. for 1940. This represents an average decline of nearly 51,300 bbl. daily.

While drilling activities shifted south and east from Fayette and Marion counties which were formerly the centers of operation, these two counties retained their production leadership. White County was the scene of greatest activity with 839 completions and 729 producers. Probably the most important factor accounting for the great amount of activity in this county was the linking of the New Harmony and East Calvin fields. However, the rapid development of the many new pools opened in the county during the year sustained much of the activity. The majority of the new pools opened in White County were small, their size being offset by the large number discovered. The best discoveries reported in the county were the South Maunee (Rising Sun) pool in 24-6s-10e and the East Centerville pool in 7-4s-10e. Excellent recovery from several zones in the South Maunee pool aroused considerable interest and development of the pool was rapid. Activity is at a low ebb in the field at present but completions to date indicate that it may be an important factor in maintaining Illinois production at the present level. The East Centerville pool was discovered late in the year and has not yet received much development. However, the size of the wells completed so far in this field indicate that it may soon rival the Roland field as the second largest producing field in the county. The Roland field also accounted for a large amount of the White County activity and received the greatest number of large wells completed in the county. Discovered early in the year, it has not yet been limited by dry holes. It is now productive from three zones and has been extended several times.

Other pools discovered and developed during 1941 are the most important uncovered since Louden and Salem. Several of them may be classed as major discoveries. Most prolific of these was the Johnsonville pool in Wayne County. Discovered in July, this pool received one of the most intensive drilling campaigns in the state's history and in less than 3 months was producing nearly 60,000 bbl. daily. Production has already declined somewhat but it is still the third largest producing pool in the state. Production at Johnsonville is mainly from the McClosky. However, shortly after its discovery the Aux Vases was found to be productive and many wells are now being completed in this formation. The pool has not yet been defined on the southern edge but present development indicates that it may extend several miles south of the now productive area. Formations below the McClosky are also untested at present so it is probable that Johnsonville will remain an influencing factor in Illinois production for several years to come.

The Woodlawn pool of Jefferson County is likewise a July discovery and at present is producing about 18,000 bbl. daily, a decline of 5,000 bbl. daily from its peak production. Production in this pool is limited to the Benoist sand.

Another outstanding Illinois discovery in 1941, not only from a production standpoint but also because of its influence on drilling activity and exploration in the state, was the Benton pool of Franklin County. The discovery well of the pool was completed in the Tar Springs sand early in January and it ranked as the third largest producing pool in the state until the discovery of the Johnsonville pool. The Tar Springs is productive on a small scale in several pools in Illinois but nowhere has the production from this sand been equal to that obtained in the Benton pool. Encouraged by the prominence of the Benton pool, operators undertook an extensive search for Tar Springs production throughout the basin area, resulting in five additional discoveries in this formation within the following 6 months.

Most exciting of the Illinois developments during 1941 was the long-awaited Devonian testing in the Louden field. Although this formation was found to be productive, it was not nearly as prolific a producer as was expected. The discovery well came in flowing 2,500 bbl. daily but water trouble necessitated pinching down of the production on this well as well as others that have been completed. The Devonian at Louden has not undergone large scale development as yet, however, and its possibilities are not entirely known.

The rate of discovery of new oil pools in Illinois during 1941 is partially due to the large number of independent operators and lease brokers who flocked into the state but mostly to the fact that many of the geologists in the state admit that they are just now learning how to discover oil in Illinois. The coal domes in the southern part of the state which looked like poor prospects after the initial testing may become important features. Sands overlooked, or at least underestimated in original drilling, may also prove to be good producing horizons.

The Aux Vases sand is the outstanding example of the underestimated sands in Illinois. This sand is a good producer in the Salem field but was at first thought to contain little oil in the southern part of the state. This judgment was based on inspection and examination of the sand rather than on production tests of wells drilled into it. Operators have since gone back and tested this sand with the result that in many cases the "dry" Aux Vases sand has produced large quantities of oil.

The Dale pool in Hamilton County, discovered in 1940, received some development and then appeared to be washed up. The Hoodville pool, a short distance to the north and west, was also not impressive in its early days and it was believed that instead of a major field in the area there would be a succession of smaller pools. The discovery of oil in the Aux Vases sand in both these pools, however, revived considerable activity in the area and it now appears as if the two pools will be linked through production from these sands. The discovery of the Walpole pool, a few miles south of Hoodville, is a direct result of Aux Vases exploration in this area. In addition to the revived activity at Dale and Hoodville, the discovery of the Rural Hill pool, south-

(Continued on Page 158)

ILLINOIS

Summary of Wells Completed During 1941

Field—	Comp.	Oil	Prod.	Gas	Dry
Aden	3	1	40	0	2
Albion	22	21	6,773	0	1
Allendale	70	44	2,822	0	26
Alma	1	1	25	0	0
Barnhill	5	1	45	0	4
Bartelso	7	7	184	0	0
Belle Prairie	2	1	15	0	1
Benton	229	222	63,167	0	7
Bone Gap	3	3	615	0	0
Bonpas	1	1	80	0	0
Bonpas, West	9	7	247	0	2
Boyleston	14	12	2,691	0	2
Bridgeport	8	6	500	0	2
Burnt Prairie	1	1	46	0	0
Calvin	1	1	197	0	0
Carlinville, North	2	2	36	0	0
Casey	2	1	11	0	1
Centerville	2	2	116	0	0
Centerville, East	6	6	378	0	0
Centralia	11	8	525	0	3
Clay City	145	125	27,341	0	20
Clay City, West	3	3	3,486	0	0
Dahlgren	49	42	13,652	0	7
Dale	115	113	38,084	0	2
Dennison	1	1	51	0	0
Dix	10	8	733	0	2
Dubois	5	5	193	0	0
Dundas	166	138	61,003	0	28
Dupo	21	20	2,792	0	1
Eldorado	2	1	13	0	1
Ellery	1	1	145	0	0
Epworth	4	3	415	0	1
Fairfield	4	4	1,031	0	0
Fairman	10	8	768	0	2
Flora, East	2	1	125	0	1
Goldengate	3	2	200	0	1
Grayville	1	1	144	0	0
Griffin	44	42	6,951	0	2
Hardinville	6	6	1,314	0	0
Herald	2	1	115	0	1
Hoffman	2	2	34	0	0
Hoodville	117	106	19,364	0	11
Inman	46	37	5,047	0	9
Iron	7	5	379	0	2
Iola	3	3	140	0	0
Irvington	20	18	1,590	0	2
Johnsonville	237	217	199,552	0	20
Keensburg	12	9	1,093	0	3
Lawrence	2	1	35	0	1
Linn	2	2	55	0	0
Louden	207	184	30,157	0	23
Martinsville	5	5	73	0	0
Mason	19	15	1,761	0	4
Maud	12	11	1,303	0	1
Maunie	2	1	157	0	1
Maunie, North	3	3	408	0	0
McKinley	6	5	348	0	1
Mill Shoals	55	45	8,240	0	10
Mount Carmel	174	160	22,032	1	13
New Harmony	463	439	70,696	0	24
New Haven	18	18	1,153	0	0
Noble	21	18	1,319	0	3
North Benton	13	6	651	0	7
North Boos	27	23	8,303	0	4
Omaha	25	18	2,295	0	7
Parkersburg	29	24	28,372	0	5
Patoka and East	63	56	6,342	0	7
Patton	8	4	576	0	4
Phillipstown	6	6	213	0	0
Plymouth	3	1	2	0	2
Posey	2	1	430	0	1
Rising Sun	58	52	6,395	0	6
Roaches	2	2	128	0	0
Robinson	2	1	6	0	1
Roland	100	91	19,933	0	9
Rural Hill	97	94	43,866	0	3
Russellville	13	0	0	9	4
St. James	11	8	422	0	3
St. Francesville, East	3	3	233	0	0
Ste. Marie	2	2	992	0	0
St. Paul	1	1	150	0	0
Sandoval	4	2	825	0	2
Siggins	1	1	2	0	0
Simms	4	3	758	0	1
South Lawrence	8	6	873	0	2
South Herald	2	1	18	0	1
Stokes	4	4	712	0	0
Storms	29	25	3,428	0	4
Thompsonville	4	3	294	0	1
Tonti	6	5	305	0	1
Walpole	28	25	6,653	0	3
Waterloo	2	2	30	0	0
Westfield	6	0	0	1	5
West Centralia	10	6	615	0	4
West Irons	15	14	1,434	0	1
Womack	1	1	64	0	0
Woburn	2	1	20	0	1
Woodlawn	143	137	45,556	0	6
Wildcats	653	91	25,099	2	560
Miscellaneous	25	15	3,582	0	10
Total 1941	3,838	2,912	807,784	13	913

Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	256	184	0	72	642,028
February	199	140	0	59	521,994
March	242	182	3	57	471,466
April	259	188	3	68	785,529
May	352	266	1	85	673,807
June	303	227	0	76	739,791
July	328	243	2	83	960,386
August	456	363	0	93	897,954
September	472	390	1	81	1,244,181
October	357	277	2	78	903,872
November	352	271	0	81	920,034
December	262	181	1	80	701,091
Total	3,838	2,912	13	913	9,462,133

PRODUCTION, 1937-1941 (Continued)

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Phillipstown	.....	.....	7,158	49,333	55,838	.....	6	11
Rising Sun	.....	.....	.....	.....	371,179	.....	.....	52
Roland	.....	.....	.....	2,395	1,101,050	.....	1	91
Stokes	.....	.....	63,637	1,071,175	86,522	.....	11	17
Storms	.....	.....	41,902	1,514,168	1,397,607	.....	128	153
Mill Shoals	.....	.....	121,071	571,341	925,380	.....	50	94
Epworth	.....	.....	.....	.....	11,665	.....	.....	4
Total	.....	.....	239,276	5,064,152	15,100,268	.....	473	1,200
Old eastern fields:								
Casey	461,560	193,630	283,625	334,524	394,073	3,303	3,060	3,030
Robinson-Stoy	1,632,174	1,597,000	1,063,000	1,247,248	1,412,923	6,408	5,939	5,880
Bridgeport	2,038,046	1,751,000	1,304,000	1,641,374	2,092,074	3,290	3,289	3,261
Allendale	139,291	384,000	87,000	106,000	89,871	319	207	202
Total Illinois*	7,529,217	22,348,649	91,934,331	146,450,876	128,630,969	13,925	20,954	23,411

*Includes abandoned and miscellaneous fields. Production from miscellaneous fields in 1941: Xenia, 1,699 bbl.; Iola, 2,517 bbl.; Posey, 1,896 bbl.; Mattoon, 8,289 bbl.; Whittington, 5,100 bbl.; Bungay, 3,028 bbl.; Elkville, 416 bbl.; Hidalgo, 843 bbl.; Ina, 1,076 bbl.; Marcoe, 1,345 bbl.; Raymond, 1,740 bbl.; St. Francisville, 2,205 bbl.; Ste. Marie, 6,445 bbl.; Eldorado, 892 bbl.; Mount Erie, 876 bbl.; Rinard, 365 bbl.; Jeff, 3,820 bbl.; Mayberry, 6,484 bbl.; Carmi, 1,574 bbl.; Maunie, 4,333 bbl.; Maunie North, 6,040 bbl.

NEW FIELDS AND FLANK SANDS ON OLD DOMES SHARE INTEREST

By
F. L. SINGLETON

NEW ORLEANS, La.—Operators in the Louisiana Gulf Coast district marked up another successful year of development as 16 new fields were opened while exploration around known salt structures continued to add several million barrels in new reserves. There were 872 wells drilled, a decrease of 117 from the previous year. Of this number 18 were gas wells and 238 were dry holes.

The producing depths of the new fields range from 6,700 to 10,990 ft., and while the majority are in the early stages of development, multiple sands logged in the discovery wells mark many of them as important reserves. The most important fields appear to be Bayou Sale, St. Mary Parish, and the St. Gabriel field in Iberville Parish, both of which have received sufficient development to definitely establish them as important discoveries. Bayou Sale, located about 3½ miles northwest of the Bateman Lake field, was opened by Humble Oil & Refining Co. from sand at 10,100-10 ft. At the end of the year five wells had been completed on the structure extending production in a north-south direction for approximately 2½ miles, and a new sand had been opened on the south end of the structure at 10,310-42 ft. The field is being developed by

PRODUCTION, 1937-1941

						Number of wells		
Acadia Parish:	1937	1938	1939	1940	1941	1-1-37	1-1-41	1-1-42
Bayou Mallett	64,013	49,417	87,798	81,120	90,475	4	5	5
Bosco-Cankton	3,031,370	2,084,536	1,753,289	1,737,007	1,523,379	58	56	53
Jennings	2,954,872	7,469,709	8,432,723	5,493,439	5,027,896	52	137	149
North Crowley	.....	368,502	818,984	1,594,354	2,026,714	.....	36	41
Ritchie	.....	.....	.....	92	130,040	.....	1	7
South Crowley	.....	240	.....	13,933	76,741	.....	2	3
Tepetate	2,133,747	1,902,500	1,890,497	1,612,514	1,441,543	38	50	44
Total	8,184,002	11,971,587	13,043,888	10,578,753	10,354,497	152	289	304
Ascension Parish:								
Darrow	611,344	773,474	1,023,974	752,961	674,204	4	17	19
Sorrento	70,464	112,322	112,303	70,801	54,609	5	4	7
Total	681,808	885,796	1,036,277	823,762	728,813	9	21	26
Avoyelles Parish:								
Eola	.....	.....	965,291	3,878,632	3,625,317	.....	92	96
Beauregard Parish:								
Bancroft	.....	62,246	895,555	1,083,505	859,998	.....	41	32
Neale	.....	.....	.....	317,392	868,730	.....	10	13
Total	.....	62,246	895,555	1,400,897	1,728,728	.....	51	45
Calcasieu Parish:								
Edgerly	63,478	59,156	57,782	98,526	110,595	14	15	15
Gillis	5,083,156	3,163,284	2,194,595	1,591,077	1,312,762	57	39	44
Lockport	494,654	378,038	383,328	305,091	298,139	21	21	21
Starks	222,000	204,376	163,484	161,710	145,731	19	22	22
Sulphur	1,416,661	1,230,537	1,376,600	986,372	926,886	67	66	66
Vinton	491,246	471,651	418,535	321,124	320,473	73	74	46
Total	7,771,195	5,507,042	4,594,824	3,463,900	3,114,586	251	227	212
Cameron Parish:								
Black Bayou	1,323,883	1,274,980	977,032	1,009,478	874,913	18	20	19
Cameron Meadows	1,504,138	1,280,154	820,714	710,912	806,491	29	30	37
Chalkley	.....	.....	220,207	949,043	1,660,619	.....	17	30
Creole	.....	156,442	559,090	581,033	394,522	.....	8	7
East Hackberry	3,252,696	2,404,165	1,961,097	1,649,644	1,610,292	47	64	60
Grand Lake	.....	.....	140,421	1,391,105	1,641,808	.....	22	22

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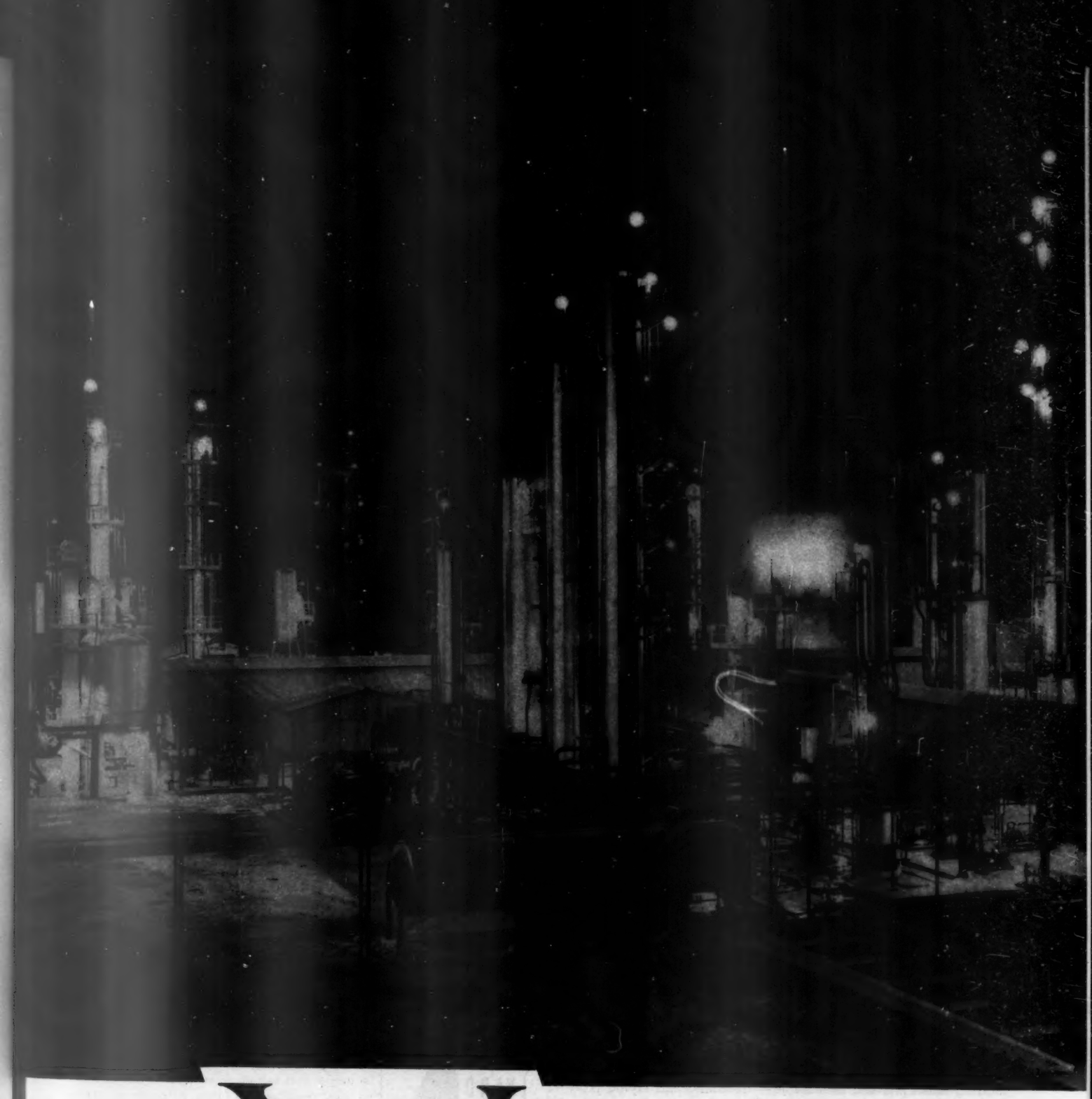
PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

LOUISIANA GULF COAST

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Ville Platte	6,047,100	16,567	246,615	225,714	389,460	496,819	481,585	479,913	591,172	623,238	586,027	626,328	648,144	652,055
Jennings	5,027,896	13,775	425,566	397,221	431,319	423,675	460,442	430,174	433,485	423,039	420,821	417,845	415,240	349,069
Golden Meadow	4,834,791	13,246	355,456	320,526	365,306	367,559	446,059	372,754	417,046	420,765	421,070	432,078	456,318	459,854
Lafitte	4,511,069	12,359	379,628	348,401	388,870	351,436	389,825	418,590	348,647	367,331	362,317	391,450	386,250	378,324
Eola	3,625,317	9,932	304,328	287,793	316,180	307,041	283,278	285,210	311,982	315,101	296,030	305,004	306,129	307,241
University	3,613,567	9,900	311,449	276,212	306,840	300,005	313,007	302,160	310,723	303,981	288,491	301,252	298,530	300,917
Iowa	3,350,428	9,179	282,857	266,262	302,055	286,951	279,589	287,580	263,768	262,297	268,693	295,800	294,212	280,364
New Iberia	2,745,849	7,523	227,378	213,230	236,993	216,160	225,091	226,812	215,835	229,460	219,399	245,845	244,330	245,337
Quarantine Bay	2,286,246	6,264	164,751	155,645	187,785	174,040	202,213	201,358	182,115	194,256	186,337	203,738	205,290	228,718
West Hackberry	2,130,799	5,838	171,372	157,873	179,189	176,073	180,792	172,503	177,572	177,132	177,176	188,650	187,304	185,163
North Crowley	2,026,714	5,553	173,733	152,080	174,981	169,188	176,730	167,428	157,593	155,228	154,118	173,535	183,434	188,666
Grand Bay	2,016,462	5,525	145,514	138,012	154,350	144,240	158,224	151,350	164,296	175,190	180,788	196,089	200,430	207,979
Caillou Island	1,983,102	5,434	172,980	155,935	176,819	157,498	168,485	172,802	154,757	169,258	155,100	159,488	163,280	176,700
Charenton	1,912,243	5,239	172,342	153,327	162,817	166,658	168,516	169,290	155,058	154,010	150,472	146,656	158,190	154,907
Chalkley	1,660,619	4,550	108,860	106,876	133,825	134,570	136,741	133,740	141,852	147,495	143,928	154,495	156,386	161,851
Grand Lake	1,641,808	4,498	155,806	141,072	153,613	134,402	151,435	139,410	127,936	129,731	126,647	130,530	127,412	123,814
East Hackberry	1,610,292	4,412	130,640	118,092	127,383	134,048	146,289	145,650	130,233	133,045	127,655	130,341	138,457	148,459
Leesville	1,588,003	4,351	148,265	130,770	152,153	139,568	129,490	129,387	124,408	128,425	124,716	126,365	129,356	125,100
Bosco-Cankton	1,523,379	4,174	141,318	125,219	133,699	128,699	134,603	130,085	116,894	119,542	118,231	121,664	122,698	130,727
Anse La Butte	1,509,085	4,134	79,981	74,595	93,524	95,315	110,360	117,540	130,885	147,019	154,645	155,721	171,540	177,940
Tepetate	1,441,543	3,949	115,338	106,253	132,550	127,424	136,246	121,106	116,423	116,485	113,257	117,376	118,247	120,838
Gibson	1,374,505	3,766	114,286	102,169	125,442	111,688	119,288	114,664	118,761	112,251	112,893	119,458	112,110	111,595
Gillis	1,312,762	3,597	104,305	94,035	115,689	115,408	120,280	113,250	117,983	113,380	102,131	108,712	111,210	96,379
Garden Island	1,210,753	3,317	103,826	96,085	106,784	98,250	107,477	106,320	88,289	98,989	96,152	100,812	101,250	106,609
Venice	1,167,999	3,200	81,517	71,113	81,966	80,942	95,356	98,854	97,798	99,734	107,601	113,613	117,520	121,985
Woodlawn	1,157,600	3,172	98,232	88,653	91,466	92,720	97,960	95,850	85,566	96,916	97,915	110,538	102,150	99,634
Paradis	1,085,260	2,973	56,647	53,934	70,873	64,399	73,842	83,336	82,353	89,508	97,541	121,461	124,710	166,656
Cheneyville	1,056,319	2,894	88,939	82,539	89,313	86,594	89,218	86,192	94,370	92,563	85,526	85,365	86,420	89,280
Port Barre	1,036,686	2,840	78,338	74,587	75,525	26,181	79,949	81,087	88,684	90,738	94,320	98,098	97,530	101,649
Barataria	1,033,067	2,830	65,622	60,723	61,752	58,886	86,211	90,028	87,315	103,116	98,992	106,136	105,786	108,500
Jeanerette	1,003,205	2,749	95,832	82,350	96,141	83,193	90,923	85,347	83,543	82,102	84,074	78,236	71,280	70,184
White Castle	934,967	2,562	81,404	74,860	84,830	72,265	86,831	85,198	68,418	72,655	70,471	77,590	76,869	83,576
Sulphur	925,886	2,537	74,764	55,301	69,166	78,134	81,065	79,829	78,105	77,578	78,638	85,703	84,213	83,390
Black Bayou	874,913	2,397	69,525	61,361	80,087	70,044	70,873	70,954	69,730	69,993	74,043	78,462	79,148	80,693
Neale	868,730	2,380	69,309	62,583	68,202	59,702	62,155	74,338	66,508	74,157	71,766	77,079	89,032	93,899
Bancroft	859,898	2,356	73,687	67,774	71,030	68,914	71,207	73,412	74,575	71,393	71,877	71,471	73,935	70,633
Cameron Meadows	806,491	2,210	74,309	66,670	71,463	69,097	72,974	71,312	61,137	60,958	61,679	65,983	64,445	66,464
Sweet Lake	768,237	2,105	61,354	53,241	60,108	57,207	66,216	65,430	60,398	63,822	67,246	73,628	72,100	67,487
Darrow	674,204	1,847	60,060	58,274	56,170	52,098	53,505	55,532	50,571	56,214	52,380	59,648	59,736	60,016
Potash	649,495	1,779	38,750	40,344	51,566	50,024	53,072	55,212	49,532	51,884	54,566	66,500	65,319	72,768
Bayou Blue	640,075	1,753	44,360	42,674	45,425	40,744	49,941	55,320	50,941	55,637	58,430	66,701	67,740	62,142
Lake Salvador	625,978	1,715	29,799	26,791	42,805	41,250	46,252	51,087	51,900	56,769	60,903	66,974	74,227	77,221
West Lake Verret	613,142	1,680	25,430	27,876	32,857	42,110	45,973	54,632	61,239	62,948	59,654	62,067	66,746	71,610
Reanoke	605,688	1,659	56,704	51,076	54,057	48,862	46,314	43,658	45,027	45,583	46,383	52,709	54,338	60,977
Gueydan	589,596	1,615	26,288	27,562	30,622	28,806	39,432	44,670	48,015	58,945	60,431	68,974	71,460	84,351
Raceland	549,308	1,505	46,885	44,377	48,598	42,755	45,787	44,369	40,396	45,326	44,284	47,841	48,253	50,437
Lake Long	537,939	1,474	42,253	42,820	50,838	41,788	47,957	44,279	39,834	40,188	41,309	53,024	50,252	53,397
Valentine	533,906	1,463	64,312	57,092	57,030	47,710	50,933	45,539	40,685	38,504	34,317	32,686	30,446	34,472
Choctaw	508,176	1,392	41,065	37,836	44,230	44,265	48,267	48,150	45,872	45,410	42,694	40,579	38,250	31,558
St. Gabriel	480,400	1,438	.....	1,200	6,388	14,041	18,321	21,396	37,430	49,594	57,346	85,081	97,320	112,313
Chacahoula	480,296	1,316	40,521	33,772	40,714	38,784	39,060	40,652	36,186	37,960	39,933	39,615	44,212	48,887
Dog Lake	466,580	1,278	39,884	39,148	40,932	38,498	44,299	42,813	38,564	44,038	36,625	36,273	32,189	34,317
Horseshoe Bayou	446,601	1,224	39,195	35,430	39,284	36,045	37,324	40,596	34,845	35,666	33,709	35,741	37,412	41,354
West Bay	411,320	1,127	6,195	5,611	9,977	10,891	16,089	20,848	29,479	42,380	50,673	61,226	74,313	83,638
Creole	394,522	1,081	38,804	35,053	38,731	36,885	38,750	37,624	31,423	29,007	25,067	29,147	26,410	27,621
Lake Pelto	385,440	1,056	35,003	32,723	35,029	31,324	32,302	31,444	27,768	33,432	27,113	28,829	34,420	36,053
Jefferson Island	357,816	980	31,731	26,648	30,875	26,745	27,590	27,932	27,283	23,971	30,746	32,923	34,296	37,076
West Cote Blanche	342,217	938	22,940	20,719	30,655	26,040	28,489	29,068	26,570	30,909	28,395	34,215	32,618	31,000
Vinton	330,473	905	23,378	20,823	23,305	22,715	22,878	25,969	25,595	24,517	31,881	35,243	36,318	37,851
Pine Prairie	233,995	851	.....	.....	.....	1,799	1,922	7,258	19,548	24,555	30,723	39,750	48,300	60,140
Erath	174,151	477	5,633	5,903	7,477	7,386	7,998	13,622	10,658	10,880	16,370	20,163	26,800	41,261



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V

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DISCOVERIES IN LOUISIANA GULF COAST DURING 1941

Pool, parish, company, and farm name—	S.T.R.	Date of comp.	Producing formation	Producing depth	Initial production	No. producing wells Jan. 1, 1942
Bastian Bay, Plaquemines, Phillips, 1 La. Ld. & Expl. Co.	38-20s-29e	8-22	Miocene	9,350-70	324 bbl., 10/64-in. choke	2
Bay Decherre, La Fourche, Texas, 1-A La Fourche Basin Levee	32-19s-24e	11-15	Miocene	2,460-2,528	1,000,000 cu. ft. gas, ⅛-in. choke	1
Bayou Sale, St. Mary, Humble, 1 Marin	16-16s-9e	6-27	Miocene	10,100-10	168 bbl., ⅛-in. choke	8
Belle Isle, St. Mary, Sun, 1 Belle Isle Corp.	6-18s-11e	4-4	Miocene	9,830-70	68 bbl., ¼-in. choke	1
De Lacroix Island, Plaquemines, Texas, 1 State	34-15s-14e	5-10	Miocene	8,915-35	Gas distillate	1
Lake Chicot, St. Martin, Amerada, 1 State	31-11s-10e	9-12	Miocene	9,025-40	204 bbl., 5/32-in. choke	2
Lakeside, Cameron, Lisbon-Iberia, 1 Calcasieu Natl. Bank	18-12s-4w	1-26	Miocene	10,050-60	192 bbl. dist., ¼-in. choke	2
Lapeyrouse, Terrebonne, Gulf, 1 Picou	70-20s-18e	9-7	Miocene	10,883-87	Gas distillate	1
Lewisburg, Acadia, Stanolind, 1 Tweedel	77-7s-3e	12-10	Miocene	10,140-10,150	Gas distillate	1
Octave Pass (Delta Duck Club), Plaquemines, Texas, 1 State	32-20s-20e	4-24	Miocene	10,750-10,802	345 bbl., ¼-in. choke	2
Pecan Lake, Cameron, Superior of Calif., 1-B Miami Corp.	29-14s-3w	4-25	Miocene	10,174-84	26 bbl. dist., 20/64-in. choke	1
Point Aufer, Terrebonne, Barnsdall, 3 Nelson	35-20s-11e	10-10	Miocene	6,750-55	24 bbl. dist., ¼-in. choke	1
Port Allen, West Baton Rouge, Amerada, 1 Wilberts	26-7s-11e	4-4	Miocene	9,610-20	288 bbl., 5/32-in. choke	3
St. Gabriel, Iberville, Titanic Oil Co., 1 Natalbany Lbr. Co.	7-9s-12e	2-19	Miocene	7,766-76	238 bbl., 9/64-in. choke	19
Unknown Pass, Orleans, W. T. Burton, 1 L.&N.R. R.R. Co.	17-11s-15e	6-23	Miocene	9,887	325 bbl., ⅜-in. choke	1
Westwego, Jefferson, Titanic, 1 Merrero Ld. Co.	2-13s-23e	7-25	Miocene	9,830-42	400 bbl. fluid, 160 bbl. salt wtr., 9/64-in. and 12/64-in. choke	3

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Humble, Atlantic, and the Texas Co. with the oil being taken by Standard Oil Co. of Louisiana which is laying a combination 4-in. and 6-in. line to its main trunk line system near the town of Franklin.

The St. Gabriel field from which production was opened by George Echols at 7,700 ft. received considerable development, and its potentiality was doubled by the opening of a new sand at 8,880 ft. Both sands overlie the structure at uniform depths, and 19 producers had been completed at the end of the year with the daily average production increased to 4,100 bbl. The discovery well was drilled on a farmout from Shell Oil Co., Inc., which retained a large part of its holdings.

The Delta district, composed largely of submerged land in which development has been limited, received an extensive exploration campaign resulting in the opening of three new fields. Two of these, Delacroix Island and Delta Duck Club were opened by the Texas Co., while the Bastian Bay field was discovered by Phillips Petroleum Co. Although development in each field has been limited, several sands in the Miocene were logged by the discovery wells, and production from new sands will probably be opened by future development.

Exploration along the northern tier of parishes in the southeastern part of the district opened additional acreage for development with the discovery of the first production in West Baton Rouge and Orleans parishes. While production in both fields, Port Allen and Unknown Pass, has thus far been limited to a comparatively small area the discoveries led to an extensive geophysical and leasing program which is expected to result in considerable wildcatting along the sector during the year.

The discovery of new sands enlarged the potentiality of several fields generally believed to be deep-seated salt dome structures, but in which no salt material has been encountered. These fields included the South Crowley field, Acadia Parish; White Lake, Vermilion Parish; Kenilworth, St. Bernard Parish; West Lake Verret, St. Martin Parish; Erath, Vermilion Parish, and the West Bay field, Plaquemines Parish. Two of the new sands were found at depths below 11,000 ft. in the Erath and West Lake Verret fields, making them the deepest crude producers in the Gulf Coast region.

Exploration around known salt dome structures continues to be one of the most important phases of development. This play began on an extensive scale in 1939 and has resulted in a consistent uncovering of new reserves as drilling was extended to practically every salt structure in the district. Old domes on which important production was opened the past year include Gueydan, Vermilion Parish; West Cote Blanche and Belle Isle, St. Mary Parish; Venice and Potash, Plaquemines Parish; Welsh, Jefferson Davis Parish; Vinton, Calcasieu Parish; Bayou Blue, Iberville Parish,

and the Pine Prairie dome in Evangeline Parish.

Probably the most important discovery was made on the east flank of the Pine Prairie dome, Evangeline Parish, by C. I. Production Co., Inc., 1 Evangeline Land & Mineral Co., completed for a prolific producer in the Sparta sand at 8,226-33 ft. Development of this structure began in 1912 when production was opened on top of the dome from sand in the cap rock and Miocene sands at intervals from 1,300-3,200 ft. However, production

(Continued on Page 158)

Summary of Wells Completed During 1941

Field—	Comp.	Oil	Prod.	Gas	Dry
Anse La Butte	59	36	6,206	1	22
Abbeville	4	2	95	0	2
Bayou Sale	1	1	216	0	0
Black Bayou	3	2	488	0	1
Barataria	14	12	3,423	0	2
Bastian Bay	1	1	324	0	0
Bayou Blue	23	18	3,365	1	4
Bateman Lake	7	0	0	5	2
Bay St. Elaine	6	5	867	0	1
Bayou Bouillon	4	0	0	1	3
Bayou des Glaise	1	0	0	0	1
Belle Chasse	1	1	265	0	0
Bayou des Allemands	4	3	599	0	1
Bayou Pigeon	5	3	964	0	2
Bayou Mallet	1	0	0	0	1
Bayou Sale	4	4	1,998	0	0
Belle Isle	5	1	68	0	4
Bosco	2	1	116	0	1
Charenton	18	14	1,116	1	4
Chalkley	15	13	3,210	0	2
Caillou Island	5	2	583	0	3
Cheneyville	5	5	557	0	0
Cameron Meadows	9	5	1,209	1	3
Chacahoula	12	5	1,083	0	7
Choctaw	5	3	644	0	2
Cote Blanche	1	0	0	0	1
Darrow	9	2	256	0	7
Delta Farms	2	2	951	0	0
Dog Lake	4	3	716	0	1
Delacroix Island	2	1	451	1	0
East Baton Rouge	4	2	194	1	1
Eola	7	5	1,257	0	2
East Hackberry	13	11	4,001	0	2
Edgerly	4	0	0	1	3
Erath	8	7	1,809	0	1
Fausse Point	6	1	270	0	5
Golden Meadow	62	54	13,635	0	8
Gueydan	13	10	2,536	0	3
Garden Island	6	6	1,097	0	0
Grand Bay	12	12	3,755	0	0
Grand Lake	1	1	133	0	0
Grandison	1	0	0	1	0
Gibson	4	3	659	0	1
Gillis	7	6	993	1	0
Happytown	1	0	0	0	1
Horseshoe Bayou	2	0	0	1	1
Hester	1	0	0	0	1
Iowa	10	8	2,706	0	2
Jeanerette	1	1	266	0	0
Jefferson Island	4	3	806	0	1
Jennings	19	16	3,187	0	3
Kenilworth	1	1	41	0	0
Lake Chicot	2	2	528	0	0
Lowry (Lakeside)	3	3	186	0	0
Lake Long	3	3	1,178	0	0
Lake Hermitage	1	0	0	0	1
Lake Mongoulois	2	0	0	0	2
Lafitte	11	11	4,741	0	0
La Fourche Crossing	2	2	113	0	0
La Pice	3	1	256	0	2
Lake Salvador	8	8	3,996	0	0
Little Chenier	1	1	18	0	0
Leeville	7	6	2,562	0	1
Lewisberg	1	1	51	0	0
Lake Pelto	2	0	0	0	2
Lockport	1	0	0	0	1
Neale	3	3	1,063	0	0
North Crowley	8	7	1,993	0	1
New Iberia	18	12	2,385	0	6
Octave Pass (Delta Duck Club)	2	2	802	0	0
Paradis	16	16	8,895	0	0
Pecan Lake	2	2	42	0	0
Port Barre	13	10	2,180	0	3
Plumb Bob	3	2	505	0	1
Potash	6	6	2,889	0	0
Port Allen	5	4	785	0	1
Perkins	1	0	0	0	1
Pine Prairie	12	10	4,252	0	2
Point Au Fer	1	1	24	0	0
Quarantine Bay	13	13	5,497	0	0
Raceland	3	3	454	0	0
Richie	16	8	670	0	8
Roanoke	2	2	367	0	0
Section 28	3	2	307	0	1
Schooner Bayou	4	3	1,000	0	1
South Crowley	7	2	148	2	3
Sulphur	11	10	1,999	0	1
South China	1	0	0	0	1
South Roanoke	2	1	36	0	1
Starks	1	0	0	0	1
Sorrento	1	0	0	0	1
Stella	3	2	317	0	1
St. Gabriel	23	20	4,664	0	3
Tepetate	1	1	192	0	0
Sweet Lake	8	7	1,697	0	1
Unknown Pass	1	1	40	0	0
Valentine	3	2	169	0	1
Ville Platte	74	65	14,988	0	9
Venice	7	7	1,630	0	0
Vinton	6	5	605	0	1
Vermilion Bay	1	0	0	0	1
Welsh	4	3	359	0	1
West Bay	13	13	5,015	0	0
West Hackberry	9	8	2,660	0	1
West Lake Verret	16	13	2,207	0	3
Westwego	4	4	546	0	0
West Cote Blanche	6	6	1,820	0	0
White Castle	3	2	516	0	1
Woodlawn	14	9	1,615	0	5
Miscellaneous	56	0	0	0	56
Total 1941	872	616	155,177	18	238

PRODUCTION, 1937-1941

(Continued from Page 146)

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Sweet Lake	287,134	279,179	1,388,386	527,813	768,237	6	12	16
West Hackberry	1,322,908	1,269,088	1,271,175	1,671,942	2,130,799	22	61	67
Total	7,690,759	6,663,988	7,338,122	8,494,289	9,914,017	122	225	262
University	.....	165,620	1,446,564	3,472,713	3,613,567	.....	89	87
Evangeline Parish:								
Pine Prairie	.....	.....	.....	.....	233,995	.....	.....	10
Ville Platte	.....	848,860	3,412,074	4,453,876	6,047,100	.....	133	190
Total	.....	848,860	3,412,074	4,453,876	6,281,095	.....	133	200
Iberville Parish:								
Bayou Blue	.....	12,416	6,966	137,421	640,075	.....	11	27
Choctaw	444,326	491,282	419,259	440,169	508,176	7	14	15
St. Gabriel	.....	.....	.....	.....	480,400	.....	.....	19
White Castle	492,027	592,037	629,838	805,993	934,967	8	14	16
Total	936,353	1,114,576	1,067,569	1,423,453	2,569,938	15	41	80
Iberia Parish:								
Bayou Pigeon	.....	.....	.....	94,108	283,566	.....	2	5
Fausse Point	.....	4,296	9,597	24,824	44,394	.....	4	5
Jefferson Island	.....	21,229	143,483	350,030	357,816	.....	6	9
New Iberia	5,932,212	5,347,124	4,209,278	3,089,091	2,745,849	19	75	80
Vermilion Bay	.....	.....	56,415	75,597	125,630	.....	2	2
Total	5,932,212	5,372,649	4,418,773	3,637,650	3,557,255	19	89	101
Jefferson Parish:								
Barataria	.....	.....	14,761	423,260	1,033,067	.....	10	21
Lafitte	4,105,393	5,951,591	4,747,483	4,535,813	4,511,069	8	50	55
Westwego	.....	.....	.....	.....	33,884	.....	.....	3
Total	4,105,393	5,951,591	4,762,244	4,959,073	5,578,020	8	60	79
Jefferson Davis Parish:								
Iowa	6,235,381	5,643,319	4,431,018	3,448,271	3,350,428	50	52	62
Roanoke	1,905,738	1,290,119	791,833	611,786	605,688	23	17	17
South Jennings*	.....	.....	.....	58,238	70,101	.....	4	6
South Roanoke	.....	41,283	289,830	372,551	245,851	.....	7	8
Welsh	11,849	10,070	8,969	8,935	30,860	14	13	17
Woodlawn	.....	177,053	470,482	870,862	1,157,600	.....	12	22
Total	8,152,968	7,161,844	5,992,132	5,410,594	5,470,156	87	103	128
La Fourche Parish:								
Chacahoula	.....	60,270	343,589	466,890	480,296	.....	7	12
Delta Farms	.....	.....	.....	21,478	145,046	.....	1	3
Golden Meadow	.....	2,294	694,397	4,009,487	4,834,791	.....	143	191
La Fourche Crossing	.....	.....	38,279	194,394	243,874	.....	4	4
Lake Long	81,282	275,369	433,259	471,966	547,939	.....	12	16
Leesville	3,072,140	1,863,035	1,318,472	1,167,676	1,588,003	86	82	82
Raceland	.....	256,742	500,506	452,063	549,308	.....	7	8
Timbalier Bay	.....	35,558	54,597	65,603	55,234	.....	2	2
Valentine	969,165	1,664,940	1,157,797	876,725	533,906	.....	25	19
Total	4,122,587	4,158,208	4,540,896	7,726,282	8,978,397	86	283	337
Plaquemines Parish:								
Grand Bay	.....	49,571	495,348	1,163,408	2,016,462	.....	21	31
Garden Island	609,253	841,636	586,396	1,097,182	1,210,753	.....	24	24
Lake Salvador	.....	.....	.....	.....	625,978	.....	.....	10
Lake Hermitage	.....	10,417	20,195	10,109	6,473	3	2	2
Lake Washington	420,170	325,337	268,795	205,369	192,450	11	7	7
Potash	.....	.....	128,603	272,102	649,495	.....	8	13
Quarantine Bay	.....	263,333	891,522	1,548,891	2,286,246	.....	23	34
Stella	.....	.....	.....	36,282	183,823	.....	2	5
Venice	167,083	510,728	528,070	828,261	1,167,999	.....	15	20
West Bay	.....	.....	.....	.....	411,320	.....	.....	14
Total	1,196,506	2,001,022	2,918,929	5,161,604	8,787,844	14	102	164
Cheneyville	99,263	157,113	360,168	969,614	1,056,319	5	31	34
St. Charles Parish:								
Bayou des Allemands	45,819	65,291	59,024	91,535	127,740	.....	5	6
Paradis	.....	.....	19,392	331,181	1,085,260	.....	8	20
Total	45,819	65,291	79,416	422,716	1,213,000	.....	13	26
St. James Parish:								
Hester	.....	18,418	17,323	16,181	28,497	.....	1	4
La Pice	.....	.....	5,439	39,080	149,254	.....	3	7
Total	.....	18,418	22,762	55,261	178,741	.....	4	11
La Place	.....	.....	5,083	28,685	185,817	.....	3	2
Port Barre	615,737	662,908	696,746	883,925	1,036,686	29	29	43
St. Martin Parish:								
Anse La Butte	72,286	74,204	24,254	409,221	1,509,065	4	28	59
Happytown	.....	.....	12,756	109,123	168,679	.....	2	2
Plumb Bob	.....	.....	.....	107,775	149,386	.....	2	4
Lake Mongoulois	.....	.....	3,161	4,429	54,032	.....	3	2
St. Martinsville	214,683	252,473	204,059	124,215	105,700	1	2	2
West Lake Verret	.....	4,788	129,331	177,051	613,142	.....	5	18
Total	286,969	331,465	373,561	931,814	2,633,923	5	42	90
St. Mary Parish:								
Bateman Lake	.....	139,658	245,810	316,709	218,480	.....	5	4
Charenton	231,934	1,055,622	2,472,489	2,846,772	1,912,243	3	179	155
Horseshoe Bayou	75,586	227,890	294,672	423,192	446,601	.....	5	6
Jeanerette	2,220,641	2,506,147	1,771,500	1,217,656	1,003,205	11	21	18
West Cote Blanche	.....	.....	.....	102,389	342,217	.....	4	6
Total	2,528,161	3,929,317	4,784,471	4,906,718	3,924,357	14	214	190
Terrebonne Parish:								
Bay St. Elaine	50,569	84,797	165,318	141,092	244,601	.....	7	10
Caillou Island	6,290,800	6,395,180	4,096,912	2,472,973	1,983,102	24	48	49
De Large	.....	11,971	31,798	59,363	47,270	.....	1	1
Dog Lake	677,680	522,898	215,638	298,518	466,580	2	10	10
Gibson	427,087	990,721	1,128,238	1,316,432	1,374,505	.....	17	18
Lake Barre	1,632,555	671,985	352,762	316,802	222,882	22	22	21
Lake Pelto	322,648	423,544	380,098	509,071	385,440	1	11	13
Lirette	.....	23,498	6,389	26,497	57,136	.....	7	6
South Houma	.....	15,957	142,489	165,892	152,927	.....	2	2
Total	9,401,339	9,141,858	6,540,469	5,306,640	4,935,505	49	125	129
Vermilion Parish:								
Abbeyville	.....	202,850	176,897	170,743	133,238	.....	7	10
Erath	.....	.....	.....	7,183	174,151	.....	1	7
Gueydan	98,173	161,487	149,527	134,168	585,596	3	5	15
West Gueydan	.....	29,472	123,933	226,939	162,012	.....	6	5
White Lake East	.....	.....	.....	12,666	80,384	.....	1	4
Total	98,173	393,809	450,357	551,699	1,139,491	3	20	42
Port Allen	.....	.....	.....	.....	72,733	.....	.....	3
*Total La. G. Coast	61,833,579	66,613,625	68,911,744	79,019,931	88,918,806	868	2,292	2,699
Daily average	169,407	182,503	188,799	215,091	243,613			

*Includes production from abandoned and miscellaneous fields. Production from miscellaneous pools in 1941: North Tepetate, 27,058 bbl.; West Mermentau, 10,650 bbl.; North Elton, 14,554 bbl.; Little Chenier, 9,138 bbl.; Lakeside, 12,188 bbl.; Pecan Lake, 5,010 bbl.; Bayou Bouillon, 6,320 bbl.; China, 3,737 bbl.; South Elton, 13,226 bbl.; Unknown Pass, 3,772 bbl.; Bastian Bay, 7,079 bbl.; De la Croix Island, 4,149 bbl.; Lake Hermitage, 6,473 bbl.; Octave Pass, 25,617 bbl.; Kenilworth, 24,856 bbl.; Lake Chicot, 25,502 bbl.; Section 28, 8,147 bbl.; Belle Isle, 1,011 bbl.; Lapeyrouse, 1,062 bbl.; Point au Fer, 110 bbl.

This oil-well cement
STAYS FLUID AND PUMPABLE

IMPROVED UNAFLO IS MORE THAN SLOW SETTING... IT'S RETARDED!

YOU CAN USE A HEAVIER SLURRY WITH IMPROVED UNAFLO

Improved Unaflo, the cement with the retarded set, provides slurry that remains both fluid and pumpable for extended periods under different hole temperatures and pressures.

Several oil-well cements, including *improved* Unaflo, often are referred to as "slow setting." But Unaflo is more, different, and better than that. Unaflo has a delayed—a postponed—a *retarded* set. The difference is important.

DIFFERENCE BETWEEN SLOW AND RETARDED SET. Normal portland cement begins to stiffen when water is added, continues to stiffen thereafter, and does so at a much faster rate when temperature increases. Slow-setting cement stiffens similarly but at a slower rate. But Unaflo has a *retarded* set, and does not congeal but remains fluid and pumpable for the entire period of retardation, after which it hardens normally. It does not stiffen, or jell, but remains fluid under different hole temperatures and pressures during the period required for pumping, including unforeseen delays and shutdowns for extended periods.

ADVANTAGES OF RETARDED SET. This characteristic is what oil men said they wanted and what Unaflo provides. Because of its *retarded* set, Unaflo cement—

1. **Permits placement of slurry while still fluid;**
2. **Remains fluid and pumpable after period of rest;**
3. **Minimizes the hazard of sticking the pipe;**
4. **Provides a safer cement for various cementing operations, including deep, tough jobs.**

IMPROVED UNAFLO DEVELOPED BY RESEARCH. Despite the satisfaction Unaflo *retarded* cement gave upon its introduction, Universal Atlas was not satisfied. Its research engineers continued their studies in the laboratory, in the plant, and in the field. The results of this research are your gain. *Improved* Unaflo is even more uniform in composition, more uniform in reaction to different types of mixing waters found on different jobs, and more uniform in retardation of setting time under different hole temperatures and pressures. As a result, *improved* Unaflo provides true cementing economy. Use it for safer, better cementing, especially on *deep, tough* jobs. Ask your dealer for Unaflo. Universal Atlas Cement Company (United States Steel Corp. Subsidiary), Amicable Bldg., Waco; Oklahoma City; Kansas City; Chicago; Birmingham.

OG-U-41

A safeguard for wells
UNAFLO OIL-WELL CEMENT

OIL SANDS FLANKING GAS-DISTILLATE FIELDS HAVE LARGE RESERVES

By F. L. SINGLETON

CORPUS CHRISTI, Tex. — Overshadowing all other developments in the Southwest Texas district the past year was the large-scale development program around the flanks of the Agua Dulce-Stratton field, Nueces County, where important crude production continued to be found from down-structure sands flanking this huge structure which had prior to 1940 produced only gas-distillate. Following the opening of the first crude production on the east and southeast flanks in 1940 drilling activity gained momentum, and the area has been the most active in the district throughout the year as from 15 to 20 rigs have been operating monthly.

New production was opened on the north flank, west flank, southwest flank, and the field now extends into the adjoining counties of Jim Wells and Kleberg with the producing area still undefined. All production is from sand lenses at intervals from 5,500 ft. to 7,200 ft. With few exceptions all of these sands can be tied in with the gas-distillate sands extending over the gas cap. Agua Dulce-Stratton is a major elongated anticlinal type of structure extending in length from 16 to 18 miles in northeasterly-southwesterly direction and having a width across the top of approximately 5 miles. It has been estimated that development during the year has proven some 3,000 acres, representing an estimated 40,000,000 bbl. in new reserves.

In line with the above development, two great gas-distillate structures were converted into oil fields by flank development. These fields included the La Gloria field, Jim Wells County, and the La Reforma field in Starr County. Production at La Gloria was opened on the west flank at 6,670-6,700 ft. by La Gloria Operators Committee 1 Unit 18 which flowed 77 bbl. of 3915 gravity oil in 12 hours. The well was located inside of a unitized block which was being developed for distillate production, and the well was taken over by Magnolia Petroleum Co. which had re-

DISCOVERIES IN SOUTHWEST TEXAS DURING 1941

Pool, county, company, and farm name—	Survey	Date of comp.	Producing formation	Producing depth	Initial production	No. producing wells Jan. 1, 1942
Chaparosa, Jim Hogg, Adams, Lucky & Neuhaus, 2 De Gallagher	No. 282	5-16	Jackson	2,855-63	Gas well	1
Carrizo, Dimmit, Producers Corp., 1 S. E. McKnight	G.W.T.&P. 643	4-13	Navarro	2,292-98	72 bbl. pumping	1
Coloma Creek, Calhoun, McSpadden Co., 1 Clark	T. Hennessee	1-3	Frio	5,890-92	Gas distillate	2
East Colorado, Jim Hogg, Forest Dev. Co., 1 Ramirez	J. S. Williams 271	3-28	Jackson	1,998-2,001	Gas well	1
Elgin, Bastrop, Marts & Beeren, 1-A Walker	G. J. Glasscock	4-12	Austin chalk	2,830-50	104 bbl. pumping	1
Floresville, Wilson, H. J. Baker, 1 J. H. Meyers	Simon & Juan Arocha	9-1	Sand	635-39	2 bbl. pumping	1
Genevieve, Bee, J. R. Dougherty, 7 Hicks	J. M. Uranga	3-15	Jackson	4,169-78	40 bbl. dist., 5/32-in. choke	1
Haldeman, Jim Wells, Magnolia, Seeligson Unit 4	V. Canales	4-25	Frio-Vicksburg	5,038-40	106 bbl., ⅛-in. choke	1
Heard, Bee, Heyser-Heard, 1 C. E. Heard	Michael & Tool	8-5	Jackson	4,764-67	12,000,000 cu. ft. gas, ⅛-in. choke	1
Lentz, Bastrop, W. J. Furlong et al, 1 Lentz	J. G. Lentz	7-18	Dale lime	2,226-44	248 bbl., ⅜-in. choke	3
Petronilla, Nueces, George B. Buescher, 1 Gillette	Robert & White subd.	9-20	Frio	7,308-12	158 bbl., 18 hr., ⅛-in. choke	3
Rios, Duval, Argo Oil Corp., 1 Gonzales	El Senor de La Carrera	8-5	Jackson	6,260-90	15 bbl. dist., ⅞-in. choke	1
South White Creek, Live Oak, Stelzig & Clark, 1 Everett	B.S.&F. No. 15	8-20	Jackson	1,844-52	700 bbl. fluid, 3 per cent salt water, ½-in. choke	3
South Campana, McMullen, Argo Oil Corp., 1 Edrington	A.B.&M. 61	7-16	Pettus	3,012-23	48 bbl., 12 hr., ⅝-in. choke	7
South Dale, Caldwell, Ogden & Riddle, 1 Copeland	Kelly No. 2	8-20	Dale lime	1,998-2,252	8 bbl. pumping	1
Steamboat Pass, Calhoun, Gulfboard, 1-177 State	No. 177	5-16	Catahoula	2,880-85	32,000,000 cu. ft. gas, open flow	1
Woodsboro, Refugio, Southern Minerals, 1 R. H. Wood	Anastacio Reojas	3-30	Frio	5,900-03½	55 bbl. oil plus 92 per cent salt water, 7/16-in. choke	3
Yturria, Sun, Sun, 1 Yturria Ld. & Livestock	Y. Trevino	9-25	Frio-Vicksburg	4,232-33½	16 bbl., 7/64-in. choke	3

PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
SOUTH TEXAS														
Government Wells	3,052,250	8,362	280,166	234,496	267,999	245,896	263,102	242,550	245,919	248,479	242,149	255,924	252,212	273,358
Seven Sisters	2,724,188	7,464	235,680	213,241	233,136	225,141	232,560	221,697	230,975	228,947	221,541	226,025	223,727	231,508
Loma Novia	2,191,586	6,004	193,723	170,368	187,432	181,589	191,387	186,205	182,753	184,665	175,474	182,771	166,739	188,680
Hoffman	2,040,454	5,590	167,674	150,053	167,569	158,502	175,555	171,780	162,181	169,030	160,652	176,929	182,191	198,338
N. Sweden (Benavides)	1,562,764	4,282	123,232	109,900	132,085	129,392	141,039	140,705	125,915	129,437	120,962	131,160	134,487	144,950
Lopez	1,444,326	3,957	132,025	115,447	127,459	120,711	127,534	121,803	114,268	114,440	107,901	114,312	118,846	129,580
Rincon	1,001,885	2,745	100,081	65,073	56,488	49,509	56,771	92,804	73,756	86,699	83,563	103,994	108,930	124,217
Bruni-O'Hern	995,116	2,726	93,687	86,385	88,897	84,055	89,486	85,177	83,351	83,165	73,835	77,467	72,328	77,283
Colorado	955,977	2,619	62,191	58,941	68,277	68,413	77,680	77,284	76,520	83,065	82,233	94,174	97,676	109,523
Driscoll	894,404	2,450	69,260	64,985	52,757	44,467	76,192	77,697	79,769	80,767	79,372	83,008	93,688	92,442
Kelsey	776,860	2,128	49,912	47,005	60,987	62,986	70,046	67,505	60,429	64,603	63,107	72,555	74,459	83,266
Piedre Lumbre	739,762	2,027	61,884	55,599	60,610	57,654	63,437	61,654	56,481	60,791	58,298	64,747	65,819	72,788
Escobas-Jennings	684,955	1,977	56,666	61,900	68,688	63,858	61,374	57,000	54,919	53,102	51,755	54,024	48,814	52,855
Fitzsimmons	561,084	1,537	41,436	36,212	44,226	45,525	51,575	49,204	45,408	47,339	45,163	49,642	50,639	54,715
Sam Fordyce	453,268	1,242	41,654	38,703	25,069	22,468	44,899	30,034	43,346	45,179	42,508	43,977	52,136	63,295
Longborn	445,477	1,220	37,916	34,464	37,648	36,537	39,867	39,754	35,654	37,229	34,278	36,757	36,058	39,215
Lundell	437,740	1,199	31,762	28,863	34,080	33,623	36,997	36,154	33,803	36,939	35,974	40,168	41,637	67,740
Sun	429,918	1,178	29,520	25,601	28,633	28,069	33,695	32,705	34,192	38,554	38,163	43,166	44,486	53,134
Glen	400,696	1,091	24,945	24,630	30,187	31,315	36,159	35,586	33,289	35,163	33,711	37,451	37,526	40,734
Alta Mesa	274,956	753	16,976	15,391	16,884	16,211	17,545	20,850	21,023	24,805	26,046	30,595	32,760	35,960
LOWER GULF COAST														
Tom O'Connor	5,674,691	15,547	461,395	419,251	465,166	444,526	490,634	477,330	449,020	472,787	452,130	499,153	510,657	532,642
Saxet	4,212,047	11,540	361,954	323,984	355,884	339,641	372,824	372,271	334,580	349,030	316,203	330,321	362,130	391,685
E. White Point	2,869,094	7,861	207,052	210,241	233,581	224,642	249,222	241,201	226,534	239,513	228,485	249,554	264,538	294,531
Heyser	2,602,012	7,129	156,771	215,859	232,357	218,977	237,125	238,346	216,149	222,649	211,825	231,841	184,048	236,065
Greta	2,330,300	6,384	170,772	153,453	192,125	193,271	210,093	177,748	193,076	198,655	187,973	206,409	212,210	234,515
Plymouth	2,271,341	6,223	173,137	173,982	192,423	183,650	196,618	157,325	182,016	193,802	185,109	206,090	208,949	218,240
McCampbell	2,021,159	5,537	171,954	174,522	181,141	170,415	175,877	185,581	157,344	153,569	144,546	151,700	166,470	182,980
Refugio	1,643,868	4,504	111,310	119,664	125,128	104,452	131,184	153,612	149,853	153,763	147,947	160,988	140,760	145,240
Luby	1,387,251	3,801	70,137	65,203	106,711	115,565	126,340	124,350	113,422	119,674	113,885	126,122	127,489	138,353
Placedo	1,330,999	3,647	109,143	99,711	108,714	103,608	110,518	111,514	101,626	106,300	101,010	111,526	82,079	85,250
Wade City	1,112,014	3,047	118,824	92,592	89,444	80,735	88,764	86,706	82,138	89,493	85,157	94,556	98,577	105,028
Flour Bluff	1,103,835	3,024	76,827	69,557	79,093	96,199	104,934	102,898	93,167	93,184	86,579	96,036	99,000	106,361
Clara Driscoll and S.	1,173,304	3,215	81,591	78,111	90,014	104,913	114,515	101,693	92,096	96,489	93,022	92,859	110,035	118,877
South Alice	919,195	2,519	67,706	60,678	77,188	74,813	81,694	80,798	72,762	74,451	72,450	77,923	84,748	93,992
La Rosa	919,061	2,518	62,000	56,189	78,154	81,432	89,051	86,075	81,150	85,150	80,796	88,415	91,496	94,953
Ben Bolt	782,181	2,143	61,647	56,789	65,119	63,412	72,302	63,754	60,642	64,702	60,517	68,261	69,086	75,950
McFaddin	694,056	1,902	56,344	51,076	57,030	55,147	61,479	58,952	55,052	56,835	54,924	60,511	61,916	64,790
Stratton	651,363	1,785	23,367	27,250	34,605	38,739	47,882	44,312	49,504	57,883	58,501	69,372	71,246	78,802
Midway	628,727	1,723	30,425	32,248	40,190	43,533	48,939	47,163	55,604	59,310	58,490	67,251	70,858	74,710
Turkey Creek (W.Saxet)	612,134	1,677	65,567	60,529	53,496	43,673	50,015	48,325	44,621	46,868	44,380	49,426	50,519	54,715
Taft	607,992	1,666	52,169	47,384	47,055	47,389	52,285	51,028	47,606	50,010	47,644	52,352	54,387	58,683
Minnie Bock	579,790	1,588	38,822	36,507	41,901	45,331	43,455	41,397	51,653	52,432	54,568	58,815	55,947	58,692
Richard King	562,243	1,540	34,368	34,228	37,995	38,029	48,616	43,289	45,137	51,311	52,898	60,939	56,129	59,303
Agua Dulce	502,109	1,376	10,797	10,897	12,367	20,132	28,609	25,201	48,706	53,537	60,953	77,366	65,008	88,536
Dirks	429,322	1,176	36,432	33,387	36,009	34,366	36,996	36,389	33,440	35,128	33,220	36,819	37,859	39,277
Orange Grove	383,179	1,050	38,453	29,949	29,087	25,693	30,152	28,415	29,811	32,196	30,370	35,078	36,085	37,944
East Premont	217,427	596	7,286	5,747	5,750	6,191	7,951	5,759	10,935	16,814	26,090	33,422	43,587	47,895
SOUTH CENTRAL TEXAS														
Luling	2,209,350	6,053	201,651	179,687	191,926	186,376	187,463	179,340	181,239	183,098	176,016	186,793	168,929	174,747
Darst Creek	1,819,287	4,984	149,053	134,682	150,228	143,259	157,138	156,332	144,235	148,369	141,489	153,717	162,838	171,647
Salt Flat	1,305,324	3,576	118,700	108,879	114,540	107,297	113,688	125,340	104,045	102,066	95,993	96,537	107,428	111,011

served the oil rights on any acreage which might be found on its holdings. Development around the flanks of the La Reforma field, was being resumed following the completion of J. L. Collins 3 Guerra, northeast of production which flowed 86 bbl. of oil in 6 hours through a 3/32-in. choke from sand at 6,152-54 ft. There are several other gas-distillate structures in the district and as a result of these new dispoveries additional exploration can be expected.

The Odem field, San Patricio County, opened as a gas-distillate field in 1939 was converted into an important producing area with the opening of crude production from new sands. Production was originally opened at 6,995-7,000 ft., but as development was revived during the year additional sands were found at intervals from 3,500-5,700 ft. with the main production coming from sand in the Frio at 5,200-5,300 ft. As the year closed, 11 wells had been completed on the structure which is undefined in several directions.

Although not fully developed, important new sand discoveries were opened in the Midway field, San Patricio County, and the Luby field, Nueces County. The discovery at Midway was opened on the north side of the field by British

SOUTH TEXAS

Summary of Wells Completed During 1941

Field—	Comp.	Oil	Prod.	Gas	Dry
Alworth	2	0	0	0	2
Alta Mesa	12	11	1,422	0	1
Adami	1	0	0	0	1
Argo	1	1	96	0	0
Boyle	9	3	127	1	5
Bridwell	8	6	724	0	2
Benavides	3	2	81	0	1
Colomena	2	0	0	0	2
Chaprosa	2	0	0	2	0
Calliham	3	0	0	1	2
Casa Blanca	26	16	787	3	7
Cedro Hill	11	7	328	0	4
Charco Redondo	1	0	0	0	1
Colorado	76	69	9,758	2	5
Charamousca	22	16	1,279	0	6
Chiltipin	2	1	12	1	0
Charco Blanco	1	0	0	0	1
Cole	6	4	126	0	2
Driscoll	14	14	2,932	0	0
East Benavides	1	0	0	0	1
Escobas	10	2	32	0	8
East Cole	1	0	0	0	1
Ezzell	3	1	9	0	2
East Colorado	1	0	0	1	0
Glen	27	20	2,753	3	4
Government Wells	4	3	207	0	1
Hoffman	22	10	543	3	9
Henne-Winch-Farris	1	0	0	0	1
Holbein	11	8	525	0	3
Jacob	3	3	50	0	0
Kelsey	41	32	5,673	2	7
Killam	36	32	2,105	1	3
Kreis	7	6	821	0	1
La Reforma	1	1	86	0	0
Labbe	3	2	168	1	0
Laurel	1	0	0	0	1
Lundell	14	9	281	2	3
Las Animas	1	0	0	1	0
Lesh	1	0	0	0	1
Lopeno	9	0	0	7	2
Lopez	1	0	0	0	1
Manila	13	9	1,395	2	2
McAllen	1	1	344	0	0
Mountain View	1	0	0	1	0
Muralla	1	1	52	0	0
North Rincon	10	6	682	0	4
Nichols	15	12	1,016	0	3
Oakville	8	5	371	0	3
Oilton	1	0	0	0	1
Palo Blanco	1	0	0	0	1
Palangana	1	0	0	0	1
Peters	2	0	0	0	2
Piedra De Lumbre	11	3	453	1	7
Randado	2	0	0	1	1
Rancho Solo	2	2	27	0	0
Rincon	87	72	10,322	4	11
Rhodes	1	0	0	0	1
Rio Grande City	10	4	233	0	6
Rios	1	1	15	0	0
Sarnosa	1	0	0	0	1
Sam Fordyce	16	13	1,017	1	2
San Salvador	1	1	150	0	0
South Calliham	3	0	0	1	2
South White Creek	4	3	1,010	0	1
San Jose	1	0	0	0	1
Sejita	2	1	130	1	0
Sun	31	26	3,374	0	5
Sweden	2	1	128	0	1
Seven Sisters	3	3	40	0	0
South Campana	8	7	550	1	0
Southland	1	1	10	0	0
Tesoro	1	0	0	0	1
Volpe	1	0	0	0	1
Weser	1	0	0	0	1
West Cole	1	0	0	0	1
West Kelsey	1	0	0	1	0
White Creek	19	11	634	1	7
Yturria	4	4	454	0	0
Yzaquirre	1	1	16	0	0
Tarancahaus	2	0	0	0	2
Miscelianeous	184	0	0	1	183
Total 1941	859	464	53,348	47	348

Average footage: Lower Gulf Coast, 5,828 ft.; South Central Texas 1,863 ft.; South Texas 3,235 ft.; District 4,084 ft.

SOUTH TEXAS PRODUCTION, 1937-1941

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Brooks County:								
Alta Mesa	157,684	178,095	144,232	259,557	274,956	1	22	34
Alta Verde	.....	.....	.....	.....	700	.....	.....	5
Total	157,684	178,095	144,232	259,557	275,656	1	22	39
Duval County:								
Kreis	.....	.....	.....	.....	19,781	.....	.....	5
Casa Blanca & N.	.....	76,373	181,821	143,758	190,695	.....	35	66
Cedro Hill	.....	.....	52,434	192,895	276,381	.....	72	68
Charamousca & S.	72,358	96,268	140,603	136,053	186,221	1	19	34
Driscoll	340,471	495,628	601,529	856,443	894,404	11	54	60
Fitzsimmons	.....	199,999	877,792	734,246	561,084	.....	79	78
Govt. Wells, N. & S.	5,694,040	4,131,226	3,174,513	3,495,287	3,052,250	726	666	651
Hoffman	673,860	1,024,130	1,549,750	1,885,420	2,040,454	39	328	334
Labbe	74,762	94,114	67,452	66,375	74,665	.....	13	15
Loma Novia	6,423,076	4,651,470	3,368,306	2,934,290	2,191,586	636	670	581
N. Sweden (Benav.)	787,558	3,677,110	2,795,364	1,939,171	1,562,764	.....	246	228
Piedra de Lumbre	317,249	353,978	438,537	728,607	739,762	30	117	128
Rancho Solo	16,744	24,462	141,382	131,247	95,302	.....	40	34
Sarnosa	303,638	225,859	175,273	154,010	159,329	32	41	38
Seven Sisters	3,618,392	2,739,397	2,364,697	2,424,068	2,724,188	341	448	425
Sweden	65,033	93,240	36,790	22,570	21,137	.....	10	5
Tarancahaus	.....	.....	.....	117,157	183,051	.....	28	26
Bridwell	.....	.....	.....	12,394	62,015	.....	4	10
Chiltipin	.....	.....	4,605	9,488	14,820	.....	4	3
Colmena	132,669	105,732	82,033	65,523	79,337	3	26	24
Kohler	68,917	51,964	28,147	23,913	28,823	8	10	11
Muralla	.....	.....	7,419	22,016	13,941	.....	3	.....
Peters and E.	63,232	42,079	24,381	41,134	43,544	6	7	8
Tesoro	.....	27,306	95,355	43,415	30,785	.....	5	3
Eagle Hill	122,368	126,368	138,560	201,601	262,319	16	52	51
Longhorn	.....	.....	441,615	660,938	445,477	.....	46	41
Lundell	.....	165,173	224,528	266,163	437,740	.....	84	95
Southland	.....	.....	20,311	49,356	32,615	.....	3	3
Miscellaneous	9,057	3,546	6,220	9,923	627	6	12	7
Total	18,783,424	18,405,422	17,039,417	17,367,461	16,425,097	1,885	3,722	3,042
Hildago County:								
Nichole	.....	.....	.....	.....	63,315	.....	.....	11
Jim Hogg County:								
Colorado	11,508	58,079	132,514	784,741	955,977	1	110	184
Manila	.....	.....	.....	43,072	118,050	.....	13	23
Randado	96,119	92,239	90,097	91,510	64,003	95	94	86
Holbein	.....	.....	.....	2,591	35,892	.....	1	10
Las Animas	.....	9,056	17,409	9,485	3,686	.....	2	2
Kelsey	.....	7,857	336,159	635,190	776,860	.....	78	110
Miscellaneous	1,181	2,759	1,978	3,114	1,997	1	1	1
Total	108,808	169,990	578,157	1,566,859	1,956,464	97	299	416
McMullen County:								
Ezzell	120,759	623,010	1,012,578	438,130	306,297	.....	142	141
Jacobs	248,665	178,432	146,457	118,699	124,377	83	69	72
Munson	.....	9,826	83,639	44,391	33,291	.....	16	16
Calliham	102,720	76,572	63,750	59,431	57,527	53	64	64
Loma Alta	21,707	30,873	21,165	13,181	15,734	2	4	4
Campana	.....	.....	.....	.....	247	.....	.....	1
South Campana	.....	.....	.....	.....	17,345	.....	.....	7
Total	493,851	918,713	1,327,589	673,832	554,817	138	295	307
Starr County:								
Cuevitas (Guerra)	186,310	229,969	161,368	158,653	94,803	11	11	13
Ricaby	.....	2,327	16,045	137,452	38,788	.....	9	9
Rincon	.....	11,624	14,591	903,655	1,001,885	.....	47	115
Sun	.....	11,695	152,432	180,459	429,918	.....	42	70
Sam Fordyce & N.	1,919,700	900,890	793,002	536,617	453,268	167	126	115
Boyle	.....	.....	.....	24,699	70,804	.....	6	10
Los Olmos	22,127	37,133	30,728	25,559	20,453	72	68	74
Rio Grande City	74,689	27,958	26,330	21,962	40,380	26	10	18
North Rincon	.....	.....	.....	7,434	81,677	.....	3	10
Yzaguirre	.....	.....	.....	2,314	2,634	.....	1	1
El Tanque	66,610	92,213	118,209	79,804	69,530	.....	15	9
Miscellaneous	3,497	10,928	7,355	7,893	13,260	5	11	6
Total	2,272,933	1,324,737	1,320,060	2,086,501	2,317,400	281	349	450
Webb County:								
Adami	.....	.....	15,407	236,358	145,731	.....	70	67
Aviator	128,659	116,675	108,777	100,634	92,666	90	65	73
Bruni-O'Herr-Cole	2,643,812	2,937,866	2,200,176	1,627,170	995,116	205	325	217
Killam	152,692	332,245	159,721	121,833	158,537	.....	59	87
Lopez	3,097,720	2,191,798	1,709,433	1,644,584	1,444,326	260	342	323
Glen	.....	.....	.....	109,276	400,696	.....	41	68
Moca	136,367	132,577	104,626	78,908	82,762	10	11	11
Oilton	139,187	695,931	354,324	132,181	158,560	.....	108	87
Volpe	.....	.....	23,732	151,712	179,993	.....	29	28
Albercas	23,539	19,998	17,873	16,011	13,891	14	16	15
North Killam	.....	930	44,106	20,091	10,802	.....	9	4
Laurel	7,272	4,075	4,863	4,327	3,692	13	5	4
Mirando City	136,742	139,221	115,843	109,483	101,048	98	67	69
Miscellaneous	1,562	2,184	3,836	3,805	126	9	2	2
Total	6,467,552	6,573,500	4,862,711	4,356,373	3,787,946	754	1,149	1,114
Zapata County:								
Comitas	549,562	209,971	252,303	229,770	169,106	106	145	148
Escobas-Jennings	900,471	690,509	691,759	801,754	684,955	273	387	367
Mirando Valley	8,262	70,842	230,698	292,491	148,652	10	95	78
Charco Redondo	4,384	2,748	3,879	4,894	4,516	4	47	44
Cuellar	(In Escobas)			37,757	28,695	20,257	16	22	24
Total	1,462,679	974,070	1,216,396	1,357,604	1,027,486	409	696	661
Total South Texas	29,746,931	28,544,527	26,488,562	27,668,187	26,344,856	3,535	5,932	6,029
Daily average	81,498	78,204	72,571	75,803	72,178			

LOWER GULF COAST PRODUCTION, 1937-1941

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Aransas County:								
McCampbell	845,461	1,877,121	2,976,927	3,047,988	2,021,159	4	257	257
St. Charles	.....	.....	.....	.....	17,450	.....	.....	3
Total	845,461	1,877,121	2,976,927	3,047,988	2,038,609	4	257	260
Bee County:								
Caesar	226,239	96,146	58,217	44,328	32,659	36	18	18
Dirks	1,282,724	782,178	597,148	515,638	429,322	99	92	93
Foley	18,348	8,547	9,169	4,101	7,970	3	4	4
Normanna	10,367	13,640	10,548	6,290	7,279	2	4	4
North Pettus	678,042	494,633	311,709	281,883	207,551	67	60	60
Pettus	374,532	240,711	196,285	132,962	128,886	39	33	34
Plummer	46,235	87,127	70,353	43,393	26,288	1	11	11
Ray	394,973	123,099	71,166	58,465	60,189	40	11	11
Tuleta	247,918	138,071	80,448	58,703	40,044	36	19	19
Tulsita	.....	.....	14,775	3,493	2,356	.....	1	1
Voss	51,203	6,159	2,610	2,390	1,349	6	2	1
Genevieve	.....	.....	.....	.....	2,604	.....	.....	1
McMurray	.....	.....	.....	.....	473	.....	.....	2
Total	3,330,571	1,990,311	1,422,428	1,151,646	946,970	329	255	258

(Continued on Page 157)

American 3 Ivey, completed through perforated casing opposite oil sand at 6,050-51 ft. for an initial production of 68 bbl. daily through a 13/64-in. choke. The sand was extended shortly afterward 1 mile east by F. W. Boykin 1 Schivner. Thus far only a limited number of new wells have been drilled to the new pay which is about 700 ft. deeper than the main Frio pay at 5,300 ft.

In the Luby field, Seaboard 9 Luby, an old well formerly completed in the 5,000-ft. pay, was deepened to a total depth of 7,315 ft., and production was opened from a new sand in the lower Frio at 7,310-12 ft. This is the third sand to be found on the structure which heretofore has produced mainly from the Miocene and upper Frio sands which overlie the structure at uniform depths at 4,300 and 5,000 ft. Some geologists are of the opinion that this sand correlates with that in the discovery well of the Petronilla field, 1½ miles northeast of the field which was opened by George B. Buescher et al 1 J. T. Gill, completed at 7,308-12 ft. However, recent developments in this area may overthrow this theory as the sand in two offsets was found to have faulted out and production appears to be limited to a small area.

The search for commercial Wilcox production in the district ended with the completion of Quintana 1-B Washburn, 1 mile southwest of the discovery well which was completed for a fair producer in the Wilcox at 5,530-50 ft. The well logged gas sand at 4,822-52 ft., and cored a thick section in the Wilcox at 5,134-51 ft., and from 5,513-89 ft. This is the shallowest Wilcox production to be opened along the trend and its structural position in relation to other wells previously drilled in the district is highly significant to fu'ure exploration. As a result a vast amount of virgin territory has been opened, and wildcatting along the updip sector is expected to show a large increase during the year.

Exploration along the lower Frio-Vicksburg trend in Starr County was very successful as one new field was opened and extensions to proven fields were recorded. Sun Oil Co. appears to have opened an important discovery on the extreme south end of the trend with the discovery of the Yturria field. Production is from a uniform sand at 4,200 ft. which has already been extended a distance of about 2 miles in a north-south direction.

There were several shallow fields opened in the

LOWER GULF COAST

Summary of Wells Completed During 1941

Field—	Comp.	Oil	Prod.	Gas	Dry
Agua Dulce	81	70	10,998	5	6
Alfred	2	2	380	0	0
Alice	6	4	156	1	1
Baffin Bay	1	0	0	0	1
Ben Bolt	13	11	2,752	1	1
Bloomington	3	3	196	0	0
Clara Driscoll	32	26	2,635	3	3
Coloma Creek	3	2	203	0	1
Cologne	11	6	457	1	4
Coleto Creek	15	12	842	1	2
Duck Bay	4	2	172	0	2
East White Point	12	11	1,430	0	1
East Flour Bluff	11	9	1,180	0	2
Seeligson (E. Premont)	20	20	2,717	0	0
East Telferner	1	0	0	0	1
East Mathis	1	0	0	0	1
East Placedo	2	2	224	0	0
Fagan	21	19	1,948	0	2
Geneive	2	1	60	0	1
Heard	1	0	0	1	0
Henshaw	1	0	0	0	1
Heyser	9	9	741	0	0
Hords Creek	1	0	0	0	1
Keeran	2	2	246	0	0
La Rosa	4	0	0	0	4
La Gloria	16	10	2,335	4	2
Luby	6	5	659	0	1
Minnie Bock	33	26	1,816	2	5
McCampbell	5	4	318	0	1
Midway	35	30	2,612	1	4
McFaddin	4	3	258	0	1
North McFaddin	5	0	0	5	0
North Keeran	2	0	0	1	1
Odem	14	11	1,386	1	2
Orange Grove	14	12	1,209	0	2
Pettus	1	1	99	0	0
Placedo	6	6	453	0	0
Plymouth	6	5	631	0	1
Premont	5	4	327	0	1
Petronilla	3	3	301	0	0
Refugio	13	11	1,004	0	2
Richard King	30	30	2,351	0	0
Riverside	1	1	88	0	0
Robstown	2	1	25	0	1
St. Charles	1	1	153	0	0
Sandia	3	1	24	1	1
Shield	9	9	1,058	0	0
South Clara Driscoll	11	8	568	0	3
Stratton	72	63	9,181	5	4
Saxet	4	2	211	0	2
Haldeman (Sellig)	4	2	244	0	2
Steamboat Pass	1	0	0	1	0
Telferner	1	0	0	0	1
Tom O'Connor	19	19	10,416	0	0
Thomaston	1	0	0	0	1
Turkey Creek	1	0	0	0	1
Victoria	10	6	467	1	3
Woodsboro	5	3	135	0	2
West Alfred	4	3	337	0	1
West Chapman	3	1	234	1	1
Wade City	28	23	3,211	0	5
Weser	3	1	48	0	2
West Tuleta	2	1	80	0	1
Willamar	4	4	729	0	0
White Point	1	0	0	0	1
Miscellaneous	87	0	0	0	87
Total 1941	734	521	70,305	36	177

LOWER GULF COAST PRODUCTION, 1937-1941 (Continued)

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Calhoun County:								
Duck Bay	.....	.....	.....	7,993	38,082	.....	2	4
Heyser	1,553,942	3,091,165	3,469,550	3,378,233	2,602,012	17	258	262
Coloma Creek	.....	.....	.....	.....	18,878	.....	.....	2
Total	1,553,942	3,091,165	3,469,550	3,386,226	2,658,972	17	260	268
De Witt County:								
Thomaston	.....	.....	.....	.....	5,334	.....	.....	1
Goliad County:								
Hordes Creek	9,648	9,385	8,743	8,099	8,303	2	2	1
Sarco	.....	819	637	1,303	805	.....	1	1
Slick	18,373	3,576	2,580	2,030	735	1	1	1
Weser	1,565	.....	.....	837	24,724	.....	1	4
Total	29,586	13,780	11,960	12,269	34,567	3	5	7
Karnes County:								
South Burnell	133,750	324,679	230,970	181,388	119,678	10	32	31
Kleberg County:								
Bird Island	.....	.....	6,911	15,457	15,448	.....	1	2
Kingville	26,650	16,675	16,029	15,240	14,098	9	9	9
Total	26,650	16,675	22,940	30,697	29,546	9	10	11
Jim Wells County:								
Alfred	.....	30,689	55,311	113,217	166,769	.....	20	24
Ben Bolt	.....	.....	128,305	739,252	782,181	.....	51	64
Camada	.....	.....	1,924	1,525	513	.....	1	1
East Premont	700	58,778	58,810	126,381	217,427	.....	5	26
La Gloria	.....	.....	6,289	13,991	15,014	.....	4	3
Magnolia City	.....	.....	18,866	92,328	35,963	.....	6	3
Premont	337,737	178,920	127,624	137,926	59,813	1	45	26
Reynolds	.....	.....	156,788	476,643	349,026	.....	31	31
Alice	.....	473,969	924,338	1,092,968	919,195	.....	56	92
Orange Grove	.....	.....	.....	191,636	383,179	.....	19	31
Wade City	.....	.....	3,566	648,370	1,112,014	.....	75	96
Gallagher	.....	.....	.....	26,173	33,287	.....	3	3
Henshaw	.....	.....	.....	.....	16,985	.....	.....	2
Seelig	.....	.....	.....	.....	12,435	.....	.....	1
Sandia	15,061	.....	.....	.....	610	1	.....	4
Total	353,498	742,356	1,481,821	3,660,410	4,104,411	2	316	407
Live Oak County:								
Dinero	2,753	.....	6,945	3,764	920	2	2	.....
Lucas	42,756	36,167	17,412	18,857	17,159	10	7	3
McNeill	33,851	22,815	17,655	21,515	14,921	5	4	4
Oakville	11,237	25,856	88,963	216,160	245,478	.....	17	21
White Creek	.....	.....	31,614	92,193	133,550	.....	25	33
South White Creek	.....	.....	.....	.....	9,546	.....	.....	3
Total	90,597	84,838	162,589	352,489	421,574	17	55	64
Nueces County:								
Agua Dulce and N.	124,489	207,804	99,632	128,946	502,109	2	9	104
Bentonville-Richard King	191,409	178,048	316,925	400,996	562,243	7	42	74
Clara Driscoll and S.	425,762	533,112	964,130	981,029	1,172,304	7	118	142
East Flour Bluff	.....	.....	.....	42,809	220,838	.....	10	22
Flour Bluff	1,585,961	1,735,930	1,365,567	1,107,807	1,103,835	16	107	107
London	27,509	17,168	11,533	11,743	14,026	.....	2	2
Luby	80,825	1,540,664	2,447,647	1,428,789	1,387,251	.....	145	149
Minnie Bock	.....	.....	119,432	379,104	579,790	.....	38	66
North Luby	.....	.....	15,530	20,615	29,397	.....	3	3
Riverside	.....	.....	35,048	30,491	26,787	.....	3	2
Robstown	.....	.....	7,229	20,617	28,621	.....	2	3
Saxet and South	12,625,430	10,919,071	7,793,645	5,334,338	4,212,047	334	512	458
Saxet Heights	2,944,488	1,123,999	461,991	223,834	94,497	205	40	40
Shield	.....	.....	12,668	14,665	86,259	.....	3	11
Stratton	20,437	129,990	116,099	74,744	651,363	.....	13	84
Turkey Creek (W. Saxet)	.....	845,857	1,296,729	933,400	612,134	.....	60	60
Petronilla	.....	.....	.....	.....	9,291	.....	.....	3
Chapman ranch	.....	.....	.....	.....	13,276	1	.....	2
Total	18,026,310	17,231,643	15,063,805	11,133,927	11,306,068	572	1,107	1,332
Refugio County:								
Greta	4,683,044	2,542,599	1,935,212	1,475,139	2,330,300	205	201	195
La Rosa	.....	51,387	960,660	1,280,877	919,061	.....	77	85
Mellon Creek	.....	.....	128,226	130,355	137,746	.....	10	10
Refugio and Fox	2,269,232	2,028,130	1,805,835	1,959,399	1,808,020	103	144	161
Tom O'Connor	4,502,528	4,423,458	4,302,614	5,820,819	5,674,691	85	427	445
Fagan	.....	.....	.....	21,472	126,712	.....	2	20
O'Connor	.....	.....	.....	.....	40,133	.....	4	4
Woodsboro	.....	.....	.....	.....	33,807	.....	.....	3
Total	11,454,804	9,045,574	9,132,547	10,688,061	11,070,470	393	865	923
San Patricio County:								
East Mathis	.....	.....	561	6,724	7,521	.....	2	1
East White Point	.....	368,463	2,090,018	2,974,477	2,869,094	.....	225	242
Midway	77,026	218,431	265,414	346,184	628,727	.....	19	47
Plymouth	5,019,187	4,477,484	4,254,301	2,739,651	2,271,341	113	179	185
Sinton	12,592	4,657	2,138	3,567	610	.....	1	1
Taft	1,237,044	780,761	1,063,670	926,068	607,992	32	69	70
White Point	20,474	20,231	12,284	12,227	12,011	1	2	2
Odem	.....	.....	.....	.....	44,240	.....	.....	12
Total	6,366,323	5,870,027	7,688,386	7,008,898	6,441,536	146	497	560
Victoria County:								
Coletto Creek	241,599	168,841	125,998	110,248	219,439	20	24	36
Cclogne	.....	.....	1,182	4,638	34,854	.....	1	7
East Placedo	.....	101,574	131,466	141,948	105,937	.....	14	17
Keeran and North	300,789	185,693	250,563	248,769	174,821	4	22	28
McFaddin	82,858	406,930	742,070	799,467	694,056	4	60	65
North McFaddin	2,670	9,070	38,689	13,158	16,979	.....	3	7
Placedo	3,002,778	3,017,458	2,148,477	1,729,419	1,330,999	95	158	161
Telferner and East	.....	32,297	6,384	8,568	9,007	.....	4	2
Terrell	.....	.....	.....	3,878	7,971	.....	1	1
Victoria	.....	.....	.....	90,928	111,323	.....	8	15
Total	3,630,694	3,921,863	3,448,83	3,151,021	2,705,386	123	295	339
Willacy County:								
Willamar	.....	.....	.....	1,519	47,263	.....	1	5
Total Lower G. C.*	45,962,186	44,290,032	45,152,754	43,816,539	41,930,384	1,625	3,965	4,466
Daily average	125,924	121,343	123,706	120,045	114,878			

*Includes production from abandoned fields.

Laredo district which experienced a fairly active wildcatting play. Probably the most important was the South Campana field, McMullen County, from which Pettus sand production was found in approximately 10 ft. of sand bottomed just below 3,000 ft. Production has been extended more than 1½ miles southwest, and at the close of the year six producing wells had been completed. Small production was being developed in the Kreis field from the Pettus sand at 3,200-3,300 ft., and drilling operations are expected to be increased as extensions were being made north and south. In addition to the new fields new sands were opened at the Government Wells and Hoffman fields, Duval County, while steady development continued in the Colorado field, Jim Hogg County, as production from the Pettus sand was extended to the north and northeast. Approximately 182 wells have been completed in this field and its development has provided an incentive for an extensive search for this type of production.

Although no outstanding fields were opened in the Balcones fault-line district, no large decrease in field operations was reflected and the district continued to receive its share of wildcatting. The majority of the field work centered around the Bee Creek and Tenney Creek fields in Caldwell County and the shallow Gas Ridge field in Bexar County as extensions to production continued to be recorded.

Additional acreage was thrown open for development as Dimmit County received its first production with the opening of the Carrizo field. While development has been disappointing, the discovery led to considerable leasing and several wildcats are scheduled to be drilled in the general area in the near future.

Drilling operations throughout the district showed a decline as a total of 1,841 wells were completed, a drop of 230 from the previous year. Of this number 89 were gas wells and 638 were dry holes. The decline was due to the fact that development of flush fields such as Wade City, Orange Grove, Ben Bolt in Jim Wells County, McCampbell and East White Point fields in Aransas and San Patricio counties and several fields in the Laredo district has been completed.

SOUTH CENTRAL TEXAS

Summary of Wells Completed During 1941

Field—	Comp.	Oil	Prod.	Gas	Dry
Alta Vista	2	1	41	0	1
Bee Creek	12	11	3,498	0	1
Burnett	2	0	0	0	2
Byersville	1	1	5	0	0
Carrizo	4	1	76	0	3
Cedar Creek	1	0	0	0	1
Chicon Lake	16	13	41	0	3
Dale	1	1	8	0	0
Darst Creek	5	4	402	0	1
Day	1	0	0	0	1
Eckert	2	0	0	0	2
Elgin	4	1	104	0	3
Elm Creek	13	12	49	0	1
Floresville	1	1	2	0	0
Gas Ridge	40	38	72	0	2
Ina	1	1	2	0	0
La Coste	3	1	12	2	0
Luling	2	2	26	0	0
Lavernia	1	1	32	0	0
Lentz	3	2	248	0	1
Minerva-Rockdale	5	1	8	2	2
Pearsall	6	6	897	0	0
Red Rock	1	1	8	0	0
Salt Flat	2	1	12	0	1
Maverick	1	0	0	1	0
Somerset	3	3	14	0	0
Tenney Creek	28	23	2,445	0	5
Thrall	2	1	3	0	1
Von Ormy	1	1	1	0	0
Washburn	3	2	876	0	1
Miscellaneous	81	0	0	1	80
Total 1941	248	130	8,882	6	112

Louisiana Gulf Coast

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from these sands was short-lived and at the time of the new discovery, the field had been abandoned. Approximately six companies entered into the new play and with the exception of one dry hole to the north, the extent of this production is still undetermined. At the close of the year 10 wells had been completed in the 8,100-8,200-ft. sand, having a daily average production of 2,000 bbl.

SOUTH CENTRAL TEXAS PRODUCTION, (1937-1941)

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Bastrop County:								
Cedar Creek and N.	18,905	21,142	17,820	14,957	11,665	11	10	10
Hilbig	204,296	119,722	99,801	68,531	82,943	12	12	12
Riddle	.....	13,658	29,860	16,526	13,562	.....	5	5
Yost	14,594	14,391	11,349	9,150	7,139	8	5	4
Elgin	.....	.....	.....	.....	4,270	.....	.....	1
Lentz	.....	.....	.....	.....	7,145	.....	.....	3
Miscellaneous	26,641	11,132	10,860	6,382	6,071	7	9	11
Total	264,436	180,045	169,690	115,546	132,795	38	41	46
Bexar County:								
Eckert	65,022	49,930	39,121	30,024	30,163	118	118	118
Somerset	232,541	209,087	201,622	185,209	188,226	961	913	916
Southton	19,751	17,550	19,656	17,820	17,518	106	102	102
Von Ormy	49,167	53,217	44,302	36,271	33,067	67	107	108
Miscellaneous	5,436	6,362	8,037	7,892	16,576	48	54	62
Total	371,917	336,146	312,738	277,216	285,550	1,300	1,294	1,306
Caldwell County:								
Buchanan	77,623	89,966	44,271	39,049	27,707	31	34	34
Dale and N. and W.	51,690	86,995	127,063	104,419	74,003	57	64	66
Dunlap-Bob Rose-Spiller	19,918	28,122	24,603	41,172	23,361	11	14	14
Larremore	24,111	23,826	16,518	18,197	18,547	12	12	12
Luling-Branyon	3,028,936	3,260,463	3,027,122	2,749,556	2,209,350	698	746	740
Lytton Springs	122,485	114,919	101,391	102,731	99,366	160	152	152
Salt Flat and N.	1,603,609	1,464,696	1,577,931	1,564,248	1,305,324	234	291	291
Tenney Creek	.....	.....	.....	3,210	89,850	.....	1	22
Bee Creek	.....	.....	.....	35,481	116,375	.....	14	26
Miscellaneous	9,300	38,905	21,334	7,363	2,386	10	6	9
Total	4,937,672	5,107,892	4,940,233	4,665,426	3,966,269	1,213	1,334	1,366
Frio County:								
Pearsall	252,356	188,106	171,241	248,611	315,159	30	27	34
Guadalupe County:								
Darst Creek and SW	2,759,230	2,747,518	2,659,738	2,160,304	1,812,987	296	366	371
Zoborowski	86,010	40,310	27,820	19,486	20,067	16	14	14
Miscellaneous	20,596	25,513	13,185	28,849	18,842	2	43	45
Total	2,865,836	2,813,341	2,700,643	2,208,639	1,851,896	314	423	430
Lee County:								
Tanglewood	.....	.....	200	6,687	.....	.....	1	.....
Medina County:								
Miscellaneous	13,722	18,528	15,057	17,702	20,747	36	71	84
Milam County:								
Minerva-Rockdale	71,196	70,071	70,990	73,476	86,080	419	397	401
Williamson County:								
Chapman-Abbot	110,766	80,429	73,187	65,611	68,794	73	70	71
Matthews	.....	.....	7,997	6,500	.....	.....	9	
Noack-Beyersville	78,941	18,016	21,768	27,958	25,980	40	31	38
Thrall	17,242	13,388	11,925	26,071	22,895	18	20	21
Total	206,949	111,833	114,877	126,140	117,669	131	130	130
Dimmit County:								
Carrizo	.....	.....	.....	.....	6,343	.....	.....	1
Miscellaneous fields	12,300	10,674	7,790	6,147	7,326	2	7	9
Total	8,996,384	8,836,636	8,503,459	7,745,590	6,789,834	3,483	3,725	3,807

Another old dome receiving its first production was Belle Isle, St. Mary Parish, where Sun 1 Belle Isle Corp. was completed as a gas-distillate producer by perforating casing opposite sand at 9,830-70 ft. The well is located on the southeast flank, and although additional wells have been drilled no production has been developed.

The Anse La Butte dome, St. Martin Parish, on which development was revived in 1940 by the opening of prolific production on the west flank, received another producing area 1½ miles east with the completion of W. R. Davis Co., Inc., 2 Voorhies, completed in sand at 9,430-40 ft. This is the deepest production yet found around the structure and the producing area is confined to the one well. There were 59 wells drilled around the flanks of the structure during the year of which 36 were completed as producers.

Flank production was opened on the north and south sides of the Gueydan field, Vermilion Parish, by Fohs Oil Co. Production on the north flank was found at 7,565-80 ft., while that on the south flank is found at intervals from 8,900-10,000 ft. Pure Oil Co. and Union Sulphur Co. entered into the development and 13 wells had been drilled at the end of the year.

The opening of production from the lower Wilcox sand in the Neale field, Beauregard Parish, highlighted development along the Louisiana sector of the Wilcox trend. The new pay was opened on the south side of the field by Atlantic 5 Musser-Davis which was drilled to a total depth of 11,175 ft., and was completed through perforated casing at 10,880-96 ft. This is the deepest Wilcox production yet found along the trend as a second well was recently completed at approximately the same depth. Prior to the discovery of this sand, all production had been produced from the upper Wilcox at approximately 8,300 ft., and the limits of the field were believed to be confined to a small area.

In the Eola field, S. W. Richardson 2 Haas, located on the northwest side of the structure, originally completed in the Wilcox at 8,548-78 ft., was plugged back and completed in the Sparta sand at 7,630-40 ft. for an initial production of 130 bbl. of 48-gravity oil per day through a 10/64-in. choke. This is the first producer to be completed in this sand section although practically all wells in the field are reported to have logged saturation in the section.

There were few Wilcox tests drilled along the downdip sector of the trend. Most of the attention was devoted to the middle Wilcox play in the central part of the state.

Illinois Fields

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west of Dale and Hoodville, indicates that this area may be an important factor in the state's production picture. The Rural Hill field was first discovered to be productive from the Levias, a formation not formerly productive in the state. The addition of the Aux Vases and McClosky as pay horizons in this field resulted in major extensions to the field and gave rise to an extensive drilling campaign that more than once boosted Hamilton County to the top spot among the active counties. The discovery of production in the Levias at Rural Hill also caused extensive testing of this horizon in many fields and its addition as a pay horizon in several of them.

The discovery of new pools in Illinois during the year was so rapid that pipe lines were unable to keep pace with the production. However, activity in the state is now at a new low for the past several months due to federally imposed restrictions on drilling and transportation facilities will be given a chance to catch up with the production. The effect of the setting of an allowable output and the enforcing of drilling regulations on Illinois production can be determined only in the future.

DRILLING LOCALIZED IN HAWKINS AND EAST TEXAS FIELDS

By D. H. STORMONT

DALLAS Tex.—Drilling in eastern Texas during 1941 was at the highest level in the past 3 years, due largely to development of the Hawkins field and increased work on small tracts in the East Texas field. Discovered only 2 days before the start of the past year, the Hawkins field proved to be the area's most important discovery in many years. During the year some 235 new producers were added, with the field's peak activity being reached during late summer and early fall months. Although activity will be curbed by the stoppage of drilling in the townsite area, Hawkins will probably remain the most active field in the district during much of the current year.

Discovery of the Hawkins field was partially responsible for an intensive exploratory drilling campaign throughout the year. The search for new reserves, however, was none too successful; only six new discoveries resulted from the 133 wildcats drilled. And of these, only three were new fields as the other three were discoveries of oil pays in gas-condensate fields. Two of the new fields found are producing from the Woodbine sand and the other's pay is the Rodessa horizon of the lower Glen Rose. In the Willow Springs gas-condensate area, two wells were completed as oil producers in the Pettit lime and one in the Rodessa pay. In the Groesbeck gas area of Limestone County, a small oil producer was completed in the Pettit to open oil production from that field.

The East Long Lake field of Anderson County was the area's first discovery of the year, in April, and at the end of the year 11 producers had been completed. The field is believed to be on a separate structure from the Long Lake field 2 miles to the southwest although production is from approximately the same depth. The Pleasant Grove discovery in Rusky County, officially completed for 215 bbl. in early July, contained five oil producers at the first of this year. The erratic faulted condition of the structure resulted in three additional tests being dry holes. This fact has tended to slow development of the field, but work is progressing on a limited scale and it is probable the field will see continued drilling this year. The one-well Tri-Cities pool was opened by British American Oil Co. in Henderson County in the middle of November and has received no further development so that its potentialities yet remain to be shown.

Opening of two oil-producing horizons in the Willow Springs field and extension of known oil pays in Chapel Hill, both large gas-condensate fields, will act to keep operators busy in those fields. Only six producers were added in Chapel Hill, Smith County, during the past year, nearly all in the last few months, to bring the field's total to 15. One of these, however, opened an 8,300-ft. oil pay 2 miles to the southwest and on the north-northeast flank additional oil-pay territory was opened from the 8,100-ft. Pettit lime. At Willow Springs in Gregg County oil production was established at the 6,500-ft. Rodessa pay and 7,300-ft. Pettit lime.

EASTERN TEXAS DISTRICT

Summary of Wells Completed During 1941

Field—	Comp.	Oil	Prod.	Gas	Dry
East Texas field:					
Longview	172	164	8,836	0	8
Kilgore	216	210	7,979	0	6
Joiner	56	54	1,710	0	2
Angus	1	0	0	0	1
Cayuga	22	15	2,391	6	1
Chapel Hill	14	11	3,246	2	1
Corsicana	2	0	0	0	2
Curry	1	0	0	0	1
East Long Lake	11	10	1,250	0	1
Flag Lake	1	0	0	0	1
Grapeland	12	0	0	12	0
Groesbeck	2	0	0	2	0
Hawkins	235	226	78,650	3	6
Long Lake	37	27	2,494	6	4
Lott	1	0	0	0	1
Mexia	2	2	72	0	0
Navarro Crossing	1	1	55	0	0
Opelika	6	0	0	5	1
Pittsburg	1	1	71	0	0
Pleasant Grove	7	4	765	0	3
Powell	3	1	9	0	2
Richland	4	4	94	0	0
Talco	50	44	14,598	0	6
Techuacanna	5	0	0	1	4
Van	6	5	3,545	0	1
Willow Springs	4	0	0	3	1
Wortham	17	13	736	0	4
Wildcats	113	6	1,205	0	107
Total 1941	1,002	798	127,706	40	164

PRODUCTION, 1937-1941

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Bazette	.....	.....	8,967	91,950	50,217	5	5	7
Corsicana	159,489	153,890	152,084	152,734	142,897	634	630	616
Currie	43,869	37,958	38,491	37,498	35,016	13	13	14
Flag Lake	3,727	136,112	153,818	124,242	74,141	1	16	11
Mexia	703,245	669,196	609,030	563,763	574,651	264	217	214
Powell	790,522	734,880	689,434	627,091	585,077	165	145	146
Richland	6,244	6,312	5,872	7,695	15,806	3	3	4
Rowe & Baker	.....	.....	3,102	46,367	23,594	.....	3	2
Sulphur Bluff	1,737,547	1,626,095	1,467,218	1,507,273	1,581,723	12	73	73
Tehuacana	.....	.....	.....	8,685	18,638	.....	2	3
Van	11,479,825	5,624,755	5,391,069	4,418,445	3,697,318	576	588	584
Wortham	.....	.....	.....	35,459	163,285	7	12	30
East Texas	169,237,733	148,318,837	146,969,889	139,143,831	130,636,770	21,981	25,922	25,784
Boggy Creek	149,822	121,645	107,290	89,362	75,230	21	18	17
Cayuga	3,159,406	3,112,829	3,339,411	3,823,775	4,210,681	170	274	284
Chapel Hill	.....	.....	.....	35,501	150,451	.....	9	15
Grapeland	580	23,897	27,377	30,877	27,234	1	1	1
Hawkins	.....	.....	.....	.....	1,429,723	.....	.....	240
Lone Star	.....	5,111	9,730	7,282	13,040	.....	1	1
Long Lake and E.	533,093	670,869	821,063	651,016	1,317,641	33	111	150
Marion	.....	.....	.....	114,355	103,862	32	35	38
Navarro Crossing	.....	16,406	187,020	189,071	186,436	.....	20	21
Pittsburgh	.....	.....	.....	11,471	32,848	.....	1	2
Pleasant Grove	.....	.....	.....	.....	17,449	.....	.....	5
Potter	35,144	35,389	29,002	22,801	29,003	23	28	29
Rodessa	12,730,306	11,479,693	9,762,098	6,402,198	4,672,539	162	500	463
Talco	9,926,024	9,498,955	9,625,038	8,720,798	9,002,414	177	725	757
Trinity	350,409	208,941	170,277	119,165	137,174	25	22	23
Waskom	18,827	19,096	21,788	20,016	14,179	.....	20	21
Total*	211,224,756	182,608,233	179,706,902	167,058,980	159,061,539	24,436	29,399	29,662
Daily average	578,698	500,297	492,348	456,445	435,785			

*Includes production from abandoned and miscellaneous fields. 1941 production from miscellaneous fields: Bolivar, 2,121 bbl.; Collinsville, 4,458 bbl.; Lott, 3,603 bbl.; Post Oak, 525 bbl.; Pottsboro, 1,422 bbl.; South Bosque, 4,315 bbl.; Tri-Cities, 5,807 bbl.; Ginter, 6,772 bbl.; Huntington, 1,198 bbl.; Nacogdoches, 1,882 bbl.; Panola, 7,157 bbl.; Pickering, 465 bbl.; Shelbyville, 465 bbl.; Willow Springs, 2,065 bbl.

DISCOVERIES IN EASTERN TEXAS DURING 1941

Field, county, discovery well—	Location—	Date	Initial prod. (bbl.)	Depth	Number of wells 1-1-42	Producing horizon—Remarks
East Long Lake, Anderson, Tex-Harvey Oil 1 Cartmell	E. Ewing Sur., 2 mi. NE Long Lake field	4/26	365	5,366-87	11	Woodbine sand
Pleasant Grove*, Rusk R. Sears and O. A. Phillips 1 J. F. Pool	Geo. May Sur., 6 mi. SW Henderson	5/20	7, 2 MCF	4,051-62	5	Woodbine sand
Willow Springs, Gregg, Humble 2 Horton-Dickson	Frost Sur.	6/19	60	7,300-08	2	Pettit lime (Trinity); first oil pay
Willow Springs, Gregg, Roger Lacy et al 1 Horton-Dickson	SE cor. J. L. T. Meredith Sur.	10/22	13, 60 MCF	6,490-6,770	1	Rodessa (L. Glen Rose); shallower oil pay
Tri-Cities, Henderson, British American 1 Young	Jos. Rice Sur., 7½ mi. SW Athens	11/14	355 oil, 31 water	7,608-24	1	Rodessa (L. Glen Rose)
Groesbeck, Limestone, B. F. Weekly 2-A Barron	E. Mabry Sur., SW part of county	11/25	22, 1.37 MCF	5,685-5,792	1	Pettit (Trinity); first oil pay in condensate field.

*Well purchased by L. O. McMillan and on new potential test July 6 rated 215 bbl. of oil.

PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

Fields—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
East Texas	130,636,770	357,909	10,870,662	9,820,626	11,330,857	10,766,709	11,255,662	10,738,827	10,280,662	10,777,708	10,287,320	11,279,811	11,253,471	11,994,455
Talco	9,002,414	24,664	756,908	480,625	670,354	708,671	734,194	711,577	828,746	836,071	806,057	830,245	799,774	840,192
Rodessa	4,672,539	12,801	474,570	416,350	448,501	417,671	416,177	393,874	396,744	376,712	341,599	338,714	315,841	335,826
Cayuga	4,210,681	11,536	357,970	327,871	359,940	342,489	359,314	346,362	354,273	350,846	342,395	356,915	349,087	363,219
Van	3,697,318	10,130	365,674	331,161	314,217	281,012	309,082	294,230	281,987	295,174	281,843	308,262	307,516	327,360
Sulphur Bluff	1,581,723	4,333	134,594	121,204	133,756	130,263	134,140	129,747	134,144	133,856	129,564	134,003	130,024	136,248
Hawkins	1,420,681	3,917	5,025	5,407	9,658	27,200	64,352	96,490	107,801	129,992	160,550	229,846	275,057	318,255
Long Lake and East	1,131,641	3,610	69,707	64,863	98,517	105,941	117,458	110,830	112,177	122,087	114,380	130,605	132,750	138,326
Powell	585,077	1,603	51,430	46,159	51,699	49,738	50,625	48,144	48,585	48,087	46,101	48,366	47,459	48,684
Mexia	574,651	1,574	47,489	43,524	47,413	46,456	48,574	46,766	49,852	48,869	48,920	49,859	47,602	49,326

IT'S THE CONSTRUCTION...

Unitized

GREATER STRENGTH

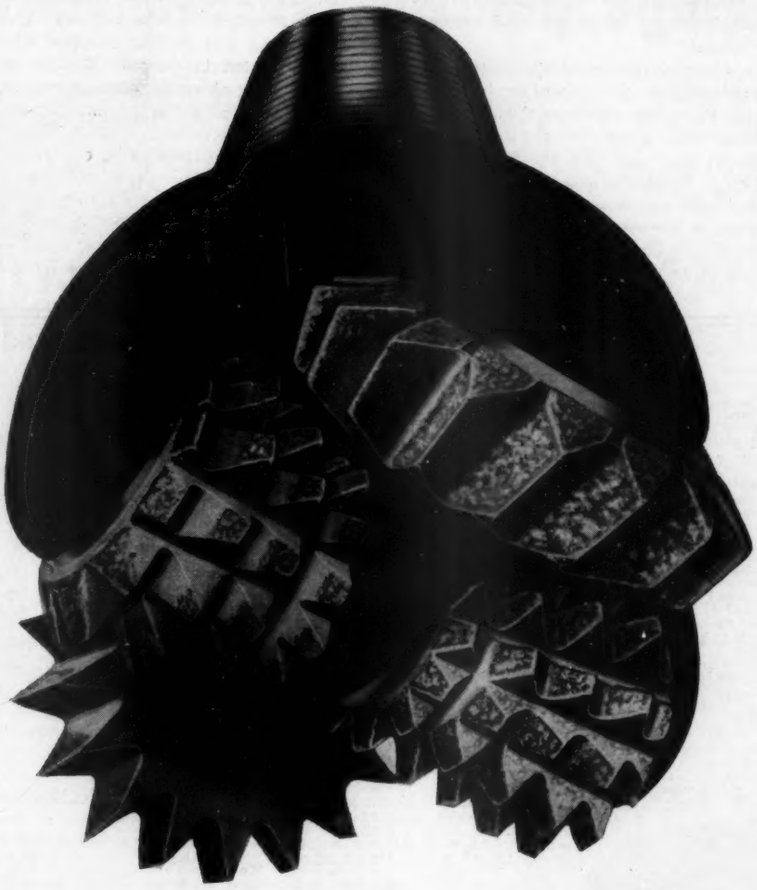
of REED ROCK BITS
that gives
STRENGTH . . . WHERE STRENGTH IS NECESSARY

In the construction of a building or in the construction of a Rock Bit, it's the *structure that counts.*

Reed Rock Bit Cutters are mounted upon *individual supports* and the four supports are *unified* to give to the entire assembly a *Strong Rugged Structure.*

Forged alloy steel cutters, Heat-treated and hard-faced with "Reedite," are accurately balanced upon extremely strong bearing assemblies.

There are eight series, or types, of Reed Rock Bits each with various cutter assemblies designed to drive specific formations most efficiently and with the *Greatest Safety.*



There's a *"Specialized"* **REED ROCK BIT**
Designed to Efficiently Drill each Specific Formation

REED ROLLER BIT COMPANY

POST OFFICE BOX 2119 HOUSTON, TEXAS

THREE REGIONAL PLAYS ADDED TO BARTON ARCH DEVELOPMENT

By ROBERT INGRAM

KANSAS had a big oil year in 1941. It produced more oil than in any other year in its history; it had more oil wells drilled than in any other year since 1937; its pipe lines were expanded or being expanded to carry some 30,000 bbl. a day more oil; more than two score new pools were opened, two of which established production in rank undeveloped parts of the state; and in its older areas, producing under strict proration, continued to spread out and increase their daily output.

Predominant during the year was the pressure from both producers and purchasers for increased crude outlets. From the purchasers' side was a market demand which grew stronger through the summer months and well into the fall as production fell off in Oklahoma and in Illinois. From the producers' side was a steadily growing supply from western Kansas.

By mid-year, a number of pipe-line projects were launched in an effort to ease the situation. Some of these lines were put into operation during the year, others were not to be finished until 1942. The entire program, however, was expected to make possible the movement of a total of from 275,000 bbl. to 300,000 bbl. a day.

As in every other year since 1936, intensive development of pools along the Barton arch, or Central Kansas uplift as it is sometimes called, resulted in the joining of many of them into big producing areas. This was probably most evident in Russell and Barton counties where development started in western Kansas and was therefore farther along than in other counties.

Possibilities for future pool joining remain high, even in this well-developed section, because drilling of offsets and outpost wells continues at the same steady rate it has held over the past 5 years, and a good share of discoveries and new extensions being brought in come right from this area. One of the most important of these was the Shell Oil Co., Inc., 1 Ruby, 36-14-13w, which early this summer extended production in the Hall-Gurney pool to the southeast. At the same time this well was brought in, the Greenvale pool itself was extended northwest, and it was generally predicted that Greenvale and Hall-Gurney would be joined before long.

The northwest extension to Greenvale was opened by Shell Oil Co., Inc., 1 Vejl, NW NW 5-15-12w. The Greenvale pool was also extended north by Phil-Hal 1 Soukup, NW SW 3-15-12w, and south by Texas Co. 1 Kaufman, N½ NW NW 9-15-12w, and a new pool—probably still another extension—was opened to the north by the Texas Co. in 32-14-12w, and called Northwest Greenvale.

Most spectacular oil find of the year was in Kearny County, not far from the Colorado State line, where Stanolind Oil & Gas Co. opened the Patterson pool in a stray Pennsylvanian sand in August. The well, located in 23-22-38w, tested the Arbuckle at 5,655 ft., then was plugged back to the sand and completed for a maximum poten-

DISCOVERIES IN KANSAS DURING 1941

Field and county—	Location	Discovery wells	Month	No. wells	Producing formation	Total depth	Initial potential
Geneseo-Simpson, Rice	31.18- 7w	Continental 4 Powell	January	1	Simpson	3,241	150
Seward, Stafford	12-22-14w	Derby 1 Roach	January	1	Arbuckle	3,787	128
High Spot, Ellis	28-12-16w	Stearns Drilling 1 Witt	February	2	Lansing	3,626	168
Gibson, Cowley	29-34- 3e	Sinclair Prairie 1 Gibson	February	1	Bartlesville	3,378	90
Bowman, Rice	21-19-10w	Sharon Drilling 1 Nevins	February	1	Arbuckle	3,295	68
Sugarloaf	17-13-17w	Derby Oil 1 Miller	March	1	Arbuckle	3,653	185
Penokee, Graham	11- 8-24w	R. W. Shields 1 Paxon	March	3	Lansing	4,104	216
West Kraft, Barton	8-17.11w	Republic 1 Radenburg	March	1	Arbuckle	3,332	68
Shaeffer, Stafford	3-21-13w	Atlantic Refining 1 Shaeffer	March	1	Arbuckle	3,552	1,175
Northwest Ainsworth, Barton	28-16-13w	Continental 1 Stoskopf	April	2	Arbuckle	3,403	539
East Frog Hollow, Cowley	15-32- 5e	Tulsa 1 Miller	April	1	Bartlesville	3,068	302
Macksville, Stafford	3-24-15w	Stanolind 1 Nagel	April	1	Kansas City	4,155	271
Shaeffer-Lansing, Stafford	4-21-13w	L. J. Bodine 1 Wilcutt	April	1	Lansing	3,405	600
Stafford-Arbuckle, Stafford	15-24-12w	Stanolind 1 Charles-B	April	1	Arbuckle	3,964	1,098
Davidson-Lansing, Barton	4-16-11w	Armer & Vernon 1 Peirano	April	1	Lansing	3,020	46
Straub, Barton	36-18-11w	Lauck & Moncrief 1 Dutton	April	1	Lansing	3,226	51
Rusch, Russell	29-14-14w	Westgate-Greenland 1 Rusch	May	1	Arbuckle	3,222	3,000
Dubuque-Lansing, Russell	27-15-12w	I. W. Murfin 1 Janne	May	1	Lansing	3,190	120
Ahnert, Stafford	26-22-13w	Stanolind 1 Ahnert	June	1	Arbuckle	3,761	1,440
Northwest Greenvale, Russell	32-14-12w	Texas 1 Borell	June	2	Arbuckle	3,171	65
Keighley-Dolomite, Butler	23-27- 7e	Phillips 1 Keighley unit	June	1	Dolomite	3,158	297
Stickney, Barton	29.16-13w	Mabee 1 Stoskopf	July	3	Arbuckle	3,390	50
Hewitt, Norton	11- 4-21w	Phillips 1 Hewitt	July	1	Lansing	3,750	68
Dayton, Phillips	36- 2-19w	Carter 1 Friebus	July	3	Lansing	3,461	328
Peace Creek, Reno	21-23-10w	Simpson 1 Snowbarger	July	12	Viola	3,789	3,000
Erway, Rooks	2-10-16w	Cities Service 1 Erway	July	1	Lansing	3,495	58
Forest Hill, Russell	29-15-12w	Central 1 Steinle	August	3	Arbuckle	3,320	1,099
Gustason, Russell	14-15-12w	Central 1 Gustason	August	1	Arbuckle	3,257	163
Rick-Kansas City, Barton	11-19.11w	Shell 1 Rader (PB)	August	7	Kansas City	3,242	3,000
West Ainsworth, Barton	5-17-13w	Bartlett 1 Wondra	August	1	Arbuckle	3,361	296
Patterson, Kearney	23-22-38w	Stanolind 1 Kearney	August	2	Patterson	4,784	3,000
Youngmeyer, Elk	25-28- 8e	Allison 1 Porter	August	1	Arbuckle	2,919	25
Bruce, Cowley	9-30- 4e	Trees and Phillips 1 Bruce	August	1	Arbuckle	3,315	87
Dreiling, Ellis	28-13-17w	Darby Petroleum 1 Dreiling	September	1	Kansas City	3,521	352
Gettysburg, Graham	7- 8-23w	Cities Service 1 Montgomery	September	1	Kansas City	4,018	71
East Welch, Rice	1.21- 6w	Aladdin Petroleum 1 Lackey	October	1	Mississippi	3,346	278
Mohl, Russell	18-14-13w	El Dorado 1 Mohl	October	1	Gorham	3,258	153
East Pawnee Rock, Barton	17-20-15w	Helmerich & Payne 1 Unruh	October	2	Arbuckle	3,819	583
Sec. 21-28-11e, Elk	21-28-11e	McPherson 1 Clogson	November	1	Kansas City	1,210	5
Friendship, Reno	30-25- 4w	Rocket Drilling 1 Soper	November	1	Viola	3,986	497
West Bornholdt, Rice	36-20- 6w	Wesgate-Greenland 1 Harder	November	1	Mississippi	3,405	45
Lake City-Simpson, Barber	18-31.13w	Pryor & Lockhart 2 Gant-C	November	1	Simpson	4,545	500
Sun City, Barber	35-30-15w	Pryor & Lockhart 1 Massey	December	1	Lansing	4,351	3,000
Kowalsky, Barton	32-20-11w	Sinclair Prairie 1 Kowalsky	December	1	Arbuckle	3,384	75
East Kraft-Prusa, Barton	36-16-11w	H. M. Williams 1 Kraft	December	1	Arbuckle	3,370	56
Hendrickson, Reno	2-23-10w	Iron Drilling 1 Hendrickson	December	1	Viola	3,714	53
Northeast Peace Creek, Reno	11-23-10w	Leader Oil 1 Tonn	December	1	Viola	3,762	3,000
Ogallah, Trego	11-12.21w	Shallow Water 1 Shaefer	December	1	Arbuckle	4,005	30
Eberhardt-Lansing, Barton	24-19-11w	Vickers 1-C Herr	December	1	Lansing	3,365	2,790
Hall-Gurney-Dodge, Russell	1-15-14w	Pidgeon 1 Flegler	December	1	Dodge	3,281	60
Deichman, Cowley	24-31- 4e	Trees Oil 1 Deichman	December	1	Bartlesville	2,839	200
Schwiezer, Reno	31-22- 9w	Central 1 Schwiezer	December	1	Viola	3,725	75
East Ray, Rooks	9- 6-20w	Derby Oil 1 Steele	December	1	Basal sand	3,639	64
GAS DISCOVERIES							(Cu. ft.)
Kruckenberg, Barton	11-19-15w	Schermerhorn-Winton 1 Merton	March	1	Basal sand	3,325	8,500,000
Preston, Pratt	18.26-11w	George Reeves 1 Stark	April	2	Viola	4,339	12,000,000
———, Ellsworth	29-15- 8w	Ingling & Parker 1	June	1	Topeka	2,555	2,200,000
———, Elk	24-28-11e	McPherson 1 Clogson	June	1	Kansas City	1,202	1,000,000
Walnut Bend	11-34- 4e	Fees 1 Lemert	July	2	Mississippi		2,300,000
Hitz, Reno	4-24- 1w	Nelson Drilling 1 Hitz	November	1	Viola	4,032	6,399,000
Ward, Pratt	11-26-12w	Central 1 Ward	November	1	Viola	4,320	2,500,000
Bergtal, Barton	22-20-15w	Helmerich & Payne 1 Schmidt	December	1	Arbuckle	....	1,500,000
Robinson, Marion	15-20- 5e	Nebraska-Wyoming 1 Robinson	December	1	Sand		1,000,000
Zook, Pawnee	16-23-16w	Stanolind 1 Smith	December	1	Arbuckle	4,121	132,000
NEBRASKA DISCOVERIES							
Falls City, Richardson	20- 1-16e	Ohio 1 Sibbernsen	June	2	Lower Hunton	2,896	862
Barada, Richardson	36-3n-16e	Skelly 1 Henry Roesch	October	5	Lower Hunton	2,438	20

OIL and GAS JOURNAL EDITION

BAASH ROSS News

BAASH-ROSS TOOL COMPANY · LOS ANGELES · HOUSTON · NEW YORK

A BULLETIN COVERING NEWS OF EQUIPMENT AND OPERATIONS IN THE PETROLEUM INDUSTRY

How to get longer life, better performance from your present drilling equipment

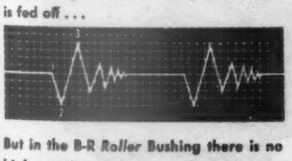
THE IMPORTANCE OF LOW STARTING RESISTANCE TO SMOOTH KELLY FEED

There's a lot more to the remarkable efficiency of the Baash-Ross Roller Kelly Bushing than first meets the eye. It has to do with the basic engineering differences between *sliding* friction and *rolling* friction . . .

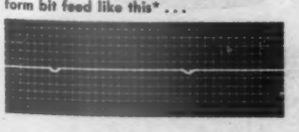
First, of course, is the obvious fact that when one surface *slides* against another, the frictional resistance is many times greater than when one surface *rolls* against another. But not so well known is the fact that in *sliding* friction it takes even more effort to start the surfaces sliding than it does to keep them sliding once they are in motion.

In rolling friction, however, this high starting resistance is not present . . . an important engineering advantage that greately affects the efficiency of your kelly feed. Here's why . . .

With the conventional kelly bushing, as you let up on the brake to feed weight to the bit, there is relatively high initial resistance to be overcome just to start the string in downward motion. Once it starts moving, however, the frictional resistance decreases and the string drops faster . . . with the result that too much weight is applied before the driller can check the acceleration. This results in a series of weight surges like this* every time weight is fed off . . .



But in the B-R *Roller* Bushing there is no high starting resistance. The string responds *instantly* to the brake and only the exact amount of weight the bit requires is fed off, resulting in smooth uniform bit feed like this* . . .



▶ This smooth uniform feed eliminates damaging torsional surges and pounding impact stresses in drill string and rig equipment . . . insures higher drilling efficiency, longer equipment life!

*Charts taken from actual field tests.

IF there ever was a time when conservation of equipment was important . . . when it was absolutely imperative that you get maximum life and efficiency from *every* item in your drilling equipment . . . *that time is NOW!*

And that is why, of all the items in the Baash-Ross line of quality oil tools, we feel that right now one tool in particular will do more to conserve your drilling equipment . . . more to cut your costs and prolong operating life . . . than any other investment you can make. And that tool is the *Baash-Ross Type 2R Roller Kelly Drive Bushing!*

We say this because operating records on well after well have conclusively proven that it not only increases drilling efficiency, but also prolongs the operating life of at least *five* other items of your drilling rig.

Here's the reason: Due to the high starting resistance in conventional kelly bushings (see column 1), every time weight is fed to the bit there is a tendency to "over-feed." This causes damaging torsional surges in the drill string and pounding impact loads on the table bearings, the swivel bearings, the wire line and the bit. Keep that up day after day, month after month, and it can't help but shorten the life of your equipment!

But because the B-R *Roller* Bushing has NO high starting resistance—and because it gives instant, friction-free kelly feed at *all* drilling speeds, under *all* conditions—it enables the driller to control bit feed more accurately, more sensitively, than with any other bushing in the field today. This in turn eliminates sudden torsional strains in the string and their damaging effect on your costly drilling equipment. It means . . .

▶ **LONGER DRILL PIPE LIFE:** The smooth effortless feed of the Baash-Ross Kelly Bushing prolongs the life of the drill string, reduces strain on threaded connections and minimizes danger of twist-offs.

▶ **HIGHER BIT EFFICIENCY:** Because the Baash-Ross Roller Bushing enables the driller to feed weight to the bit evenly and accurately, the bit cuts hour after hour at its most efficient rate. There are no sudden "bites" into the formation—no "over-feeding" to shorten bit life and decrease over-all drilling efficiency. And longer life per bit means not only faster, more economical drilling, but fewer round trips—with a consequent saving on power and depreciation.

A copy of Bulletin 4C which fully describes the Baash-Ross Roller Kelly Bushing will gladly be sent on request.

▶ **LONGER TABLE LIFE:** Sudden torsional surges in the drill string are very damaging to the rotary table bearings. But the Baash-Ross Kelly Bushing, by smoothing out kelly feed, eliminates these sudden impacts on the bearings, materially increasing the operating life of the table.

▶ **LESS SWIVEL WEAR:** The heart of a swivel is the thrust bearing upon which the entire weight of the string is rotated. Weight surges in the drill string cause pounding hammer-like blows against this bearing. Reduce these blows and you greatly prolong the life of the swivel . . . *which is exactly what the smoother, more accurate feed of the Roller Kelly Bushing does!*

BUT THAT'S ONLY PART OF THE STORY. This bushing also conserves on maintenance, for all you do is keep the bushing lubricated through the easy-to-reach grease fittings—a quick, simple operation—and the bushing gives trouble-free service for thousands upon thousands of feet of hole. A typical example is the Baash-Ross "2R" Bushing that recently came in for its *first* servicing after more than *183,000 feet* of drilling. That's equivalent to more than *thirty-six* 5000 foot wells without any maintenance except lubrication!

AND STILL ANOTHER important conservation feature is the fact that in this bushing practically all of the wear is taken by inexpensive roller bushings. By simply replacing these small bushings after thousands of feet of hard service, your Kelly Bushing is again restored to top-notch shape, ready for thousands more feet of service.

We honestly believe that every operator—regardless of the type of rotary equipment he is using, the formations he is working in, or the depths to which he is drilling—can do more to reduce his per-foot cost of hole and to increase the life of his equipment by installing a Baash-Ross Roller Kelly Bushing than by the addition of *any other single item of equipment*. That's a big statement, but we'll stand squarely behind it. Let our nearest representative explain in detail just how this bushing—whether used with square or hex kellys—will save on YOUR particular drilling operations!

ON THE LOOKOUT

A NEW RUBBER "SHOCK ABSORBER" *for Vee-belt pulleys is designed to increase the efficiency and durability of the belts by supporting them and forcing them to ride properly in the groove. Easily installed in a few minutes, the shock absorbers are said to reduce belt slippage . . . to prolong belt life on worn pulleys . . . and to reduce belt wear.* **(No. 211)**

BAASH-ROSS

MAINTENANCE ENGINEERS *faced with the problem of making present equipment last longer should find helpful a new booklet recently published on the fatigue of metals. It discusses fatigue from the designing engineer's viewpoint, and illustrates with charts and diagrams applications of the various mathematical formulas used.* **(No.212)**

BAASH-ROSS

CEMENT PLUGS CAN BE REMOVED *without drilling and without pulling tubing by use of an acid jet gun recently developed. Special nipple attached to tubing provides a seat for the gun—which is simply dropped down the tubing. A seven percent acid is then pumped down the tubing and out through the gun jets . . . removing cement plugs . . . cleaning cement coatings from oil sands . . . or drilling out limestone without pipe or bit, according to the report.* **(No. 213)**

For additional information on these items, send on a post card or letterhead your name, address and key number of items that interest you.

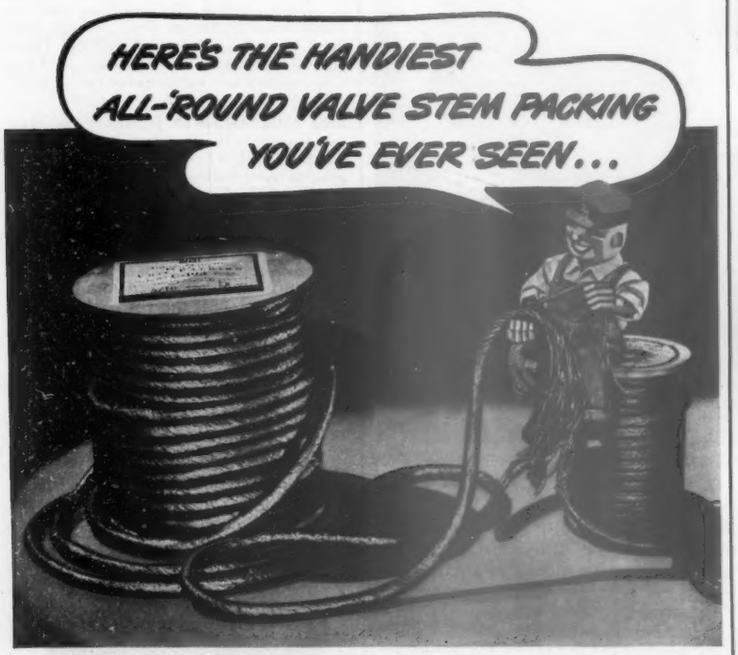
tial. The sand was at 4,740-82½ ft. It was named the Patterson.

Wichita oil men described the strike as the most significant in the past 5 or 6 years since it was well removed from production and was located in what is known as the Dodge City basin, a part of the vast Anadarko basin, West Central Oklahoma. After the discovery was made, Stan-

(Continued on Page 170)

PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

Fields—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Silica-Raymond	7,614,700	20,862	546,270	521,016	546,568	540,351	570,505	564,517	673,541	701,753	690,913	754,633	759,915	744,718
Trapp-Sellens	7,576,700	20,757	543,922	511,206	542,766	547,038	560,490	554,283	607,990	685,828	686,467	721,558	667,594	765,558
Bemis-Walters	4,865,700	13,330	349,291	328,022	356,676	361,197	361,282	359,219	438,817	446,034	438,196	480,849	455,547	490,570
Hall-Gurney	3,520,200	9,643	230,163	221,319	243,945	262,010	272,577	270,303	311,487	340,210	328,563	338,979	316,435	385,209
Burnett	3,291,000	9,015	214,987	191,663	216,093	233,009	267,883	250,980	278,623	308,955	304,323	339,589	328,092	356,803
Zenith	3,176,300	8,702	203,248	190,625	221,185	231,025	245,330	236,930	268,154	295,079	298,612	321,667	318,949	268,496
Chase-Campbell	2,745,700	7,522	202,576	192,627	197,716	208,049	213,425	208,186	248,126	244,812	245,623	262,443	240,818	281,299
Geneseo-Edwards	2,694,300	7,381	167,758	166,163	200,527	197,289	221,014	211,071	250,221	260,108	245,757	267,246	265,379	241,767
El Dorado	2,597,000	7,115	225,083	202,778	225,778	218,823	225,600	220,000	223,160	218,620	203,406	213,156	208,618	211,978
Burrton	2,539,300	6,957	221,614	196,933	208,714	206,921	210,504	208,619	209,427	222,695	210,358	214,761	205,447	223,317
Gorham	2,426,400	6,648	177,343	169,252	192,178	177,797	175,093	175,100	222,367	231,825	228,904	240,062	212,421	223,058
Stoltenberg-Wilkins	2,426,700	6,648	158,975	171,153	184,053	172,285	184,954	176,863	226,416	219,269	227,736	231,590	229,650	243,756
Bloomer-Stumps	2,331,200	6,387	164,952	158,507	170,057	167,780	175,773	173,550	206,124	218,814	210,962	242,630	239,890	202,161
Bornholdt-Welch	1,783,100	4,885	139,523	127,817	136,281	140,841	152,641	148,439	152,850	158,658	157,030	156,259	154,680	158,081
Kraft-Prusa-Krier	1,404,700	3,848	87,476	85,260	93,896	97,581	103,166	102,843	130,426	141,809	139,078	144,231	142,648	136,286
Ritz-Canton	1,365,900	3,742	114,641	102,761	121,095	117,695	122,600	118,200	115,320	116,680	110,309	113,193	110,265	103,141
Wherry and East	1,092,900	2,994	107,563	111,922	106,348	101,671	97,825	95,598	92,623	89,950	78,662	70,420	68,200	72,118
Graber-Hesston	951,100	2,606	77,487	71,657	75,348	74,737	79,272	77,439	83,250	83,120	78,232	84,965	84,618	80,975
Hittle	834,800	2,287	67,597	64,565	66,835	69,478	74,542	70,110	72,301	73,111	68,400	70,295	67,877	69,689
Seeley-Wick	799,600	2,191	62,637	59,993	68,505	67,890	68,075	67,300	66,201	67,350	65,981	68,038	68,500	69,100
Big Creek-Vaughn	798,300	2,187	58,648	51,218	55,102	51,536	62,402	56,192	70,389	80,481	82,623	77,217	70,473	82,019
Atyco-Pixley	745,400	2,042	59,143	55,948	60,710	60,737	60,100	60,500	66,254	66,008	62,610	65,851	62,100	65,439
Lost Springs	673,200	1,844	35,719	35,404	45,501	47,100	58,735	58,202	64,538	65,741	65,831	65,421	64,953	66,055
Atherton-Russell	636,600	1,744	54,922	51,703	55,398	54,634	55,691	54,160	55,158	54,962	51,860	52,091	52,800	43,221
Virgil-Dunaway	620,400	1,700	49,292	44,341	52,900	53,241	52,800	53,200	52,081	50,682	48,213	50,518	49,926	63,206
Sallyards	575,400	1,576	48,451	44,196	48,911	51,891	51,425	51,560	48,926	48,831	46,111	46,963	45,250	42,885
Fairport and North	573,700	1,572	48,814	46,958	51,223	48,454	49,950	47,995	48,113	47,691	45,358	46,999	44,804	48,341
Augusta	560,500	1,536	45,865	42,876	50,985	50,113	51,706	50,000	49,219	48,106	42,301	44,961	41,851	42,517
Voshell	585,500	1,604	49,004	46,054	49,743	48,236	48,984	48,112	47,983	50,493	49,117	50,778	50,591	46,405
Neosho Falls	539,680	1,479	43,775	43,399	44,783	44,240	44,800	44,200	45,605	46,200	44,728	45,658	45,100	47,192
Hollow-Nikkel	528,360	1,448	43,961	38,820	41,662	43,269	44,000	43,200	46,119	46,261	42,216	43,168	44,831	50,853
Richardson	528,600	1,448	41,001	37,754	40,740	40,673	42,771	40,977	45,752	47,954	46,369	49,207	48,718	46,684
Leon-Weaver	523,200	1,433	37,682	35,428	38,422	38,445	38,860	37,940	45,120	49,680	50,610	52,811	53,101	45,101
Laton	518,000	1,419	30,793	28,791	34,801	35,479	39,430	37,680	51,767	57,370	47,157	48,666	56,039	51,027
Lorraine	461,400	1,264	34,639	36,245	38,038	36,955	38,712	36,875	41,111	40,852	38,819	40,750	38,741	39,663



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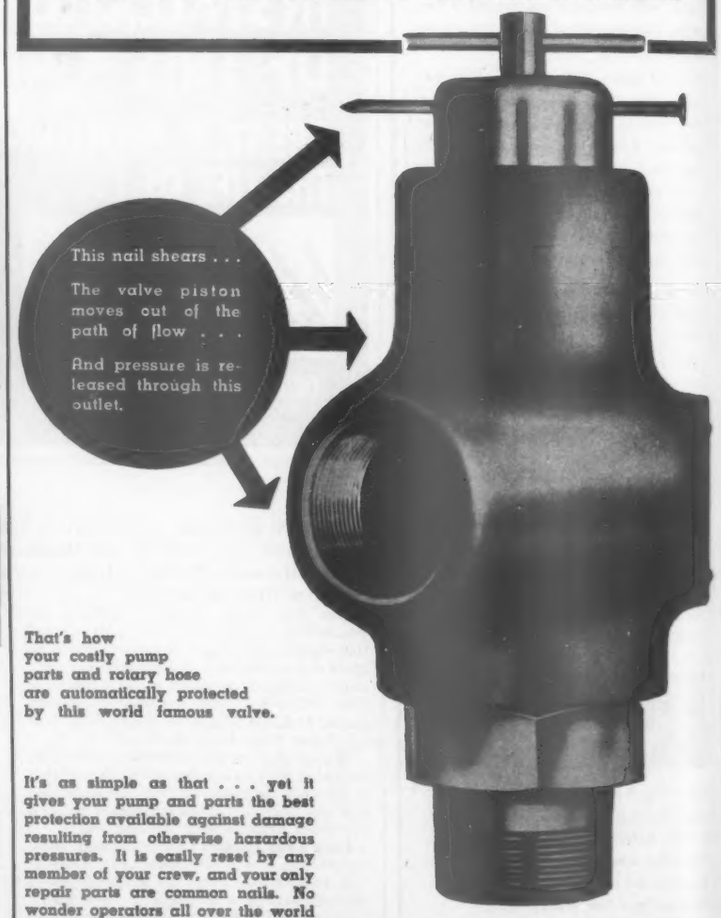

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SHEAR-RELIEF VALVE

KANSAS

Summary of Wells Completed in 1941

	Comp.	Oil	Prod.	Gas	Dry
Abbyville	4	3	575	0	1
Ahnert	1	1	1,440	0	0
Ainsworth and NW	16	13	14,191	0	3
Albert	7	5	1,372	2	0
Atherton	3	2	908	0	1
Augusta	12	11	310	0	1
Beaumont	3	1	10	2	0
Beaver	11	7	3,619	0	4
Bedford	12	12	25,148	0	0
Bemis-Shutts	52	49	94,188	0	3
Big Creek district	33	32	16,636	0	1
Bloomer	27	22	19,372	0	5
Blue Hill	4	3	5,559	0	1
Bornholdt	11	9	6,714	0	2
Bowman	4	4	942	0	0
Brandt	6	5	1,691	0	1
Breford	14	11	15,532	0	3
Bruce	1	1	691	0	0
Burnett	59	54	104,714	0	5
Burrton	9	8	1,195	1	0
Cairo	5	1	3,000	3	1
Campbell	3	3	726	0	0
Chase and North	25	22	25,077	0	3
Coralena	28	27	32,172	0	1
Couch	11	9	4,492	0	2
Cramm	2	2	1,470	0	0
Cunningham	27	23	22,178	2	2
Darien	1	1	784	0	0
David and South	4	1	50	0	3
Northeast Davidson	6	5	2,113	0	1
Dayton	2	1	142	0	1
Demalorie-Sowder	2	2	217	0	0
Donovan	4	3	1,129	0	1
Dopita	3	3	792	0	0
Doran	4	3	296	0	1
Douglas	7	2	57	0	5
Drach	3	3	370	0	0
Drieling	4	4	702	0	0
Dubuque	6	2	750	0	4
Dunaway	2	2	30	0	0
Eberhart	2	2	5,864	0	0
Edwards	18	18	41,681	0	0
El Dorado	22	21	1,196	0	1
Emmeran and North	5	4	2,411	0	1
Fairfield	4	4	712	0	0
Fairport	4	4	906	0	0
Feltes	8	6	10,123	1	1
Forrest Hills	4	3	1,724	0	1
Frog Hollow	12	10	5,109	0	2
Geneseo	36	33	46,056	0	3
Gibson	6	5	1,200	0	1
Goodrich	3	3	1,481	0	0
Gorham	11	9	7,251	0	2
Graber	6	5	1,647	0	1
Greenvale district	26	21	22,599	0	5
Hagen	2	1	339	0	1
Hall-Gurney	117	110	120,992	0	7
Hartsook	2	1	287	0	1
Haverhill	3	2	75	0	1
Hendrickson	1	1	217	0	0
Henne	3	3	1,137	0	0
Higler	1	1	2,190	0	0
Hittle	1	1	2,290	0	0
Hoffman	3	3	2,440	0	0
Hugoton	12	0	0	12	0
Iuka	2	2	3,963	0	0
Jordan	3	3	5,626	0	0
Karber	2	1	64	0	1
Keesling	24	21	6,705	0	3
Keighly	3	3	641	0	0
Keller	7	3	90	1	3
Kipp	3	3	3,982	0	0
Koblitz	3	3	3,857	0	0
Kraft-Prusa	65	56	58,152	0	9
Krier	13	12	10,970	0	1
Lanterman	6	4	8,901	0	2
Laton	35	33	19,553	0	2
Lost Springs	44	37	12,297	0	7
Macksville	6	2	366	0	4
Mahoney	1	1	955	0	0
Marshall	3	3	390	0	0
Max	6	4	6,080	0	2
McLouth	52	7	277	33	12
Morel	1	1	3,000	0	0
Niedenthal	3	2	992	0	1
Ogallah	1	1	30	0	0
Orth and East	6	4	957	0	2
Otis	2	2	2,385	0	0
Patterson	1	1	461	0	0
Pawnee Rock and East	24	23	22,232	0	1
Peace Creek and NE	21	18	51,000	0	3
Penokee	2	1	216	0	1
Polhamus	1	1	10	0	0
Potwin	4	2	95	0	2
Ray	32	31	54,902	0	1
Raymond	27	25	39,819	0	2
Rick	13	9	12,971	1	3
Ritz	5	3	240	0	2
Rock	5	5	1,037	0	0
Roxbury and East	7	7	5,399	0	0
Rusch	5	4	3,884	0	1
Severy	10	5	266	0	5
Shaeffer	8	7	13,576	0	1
Silica district	95	76	83,789	0	19
Sittner	3	2	1,458	0	1
Sperling	1	1	217	0	0
St. John	5	2	6,000	0	3
Stafford	19	18	29,894	0	1
Stern	2	2	70	0	0
Stoltenberg	41	37	38,670	0	4
Stratman	1	1	217	0	0
Strabu	1	1	123	0	0
Stumps	1	1	61	0	0
Sun City	1	1	3,000	0	0
Thrall	2	2	3,005	0	0
Trapp and West	96	84	97,295	0	12
Vaughn	3	3	1,965	0	0
Virgil	9	6	50	0	3
Voshell	2	2	156	0	0
Walters	1	1	311	0	0
East Welch	1	1	278	0	0
Wenke and West	2	2	65	0	0
Westhusin	1	1	215	0	0
Whelan	4	2	1,236	0	2
Wherry	8	4	530	0	4
Wilcutt	1	1	660	0	0
Wilkins	21	18	24,268	0	3
Young	1	1	36	0	0
Zenith	84	80	120,800	0	4
Miscellaneous	286	85	8,377	17	184
Wildcats	214	8	1,935	3	203
Total	2,112	1,436	1,482,313	79	597

PRODUCTION, 1937-1941

WESTERN KANSAS

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Barber County:								
Whelan	58,020	74,310	66,503	94,759	159,100	2	15	18
Miscellaneous	3,278	19,786	28,295	27,704	12,200	1	4	4
Total	61,298	94,096	94,798	122,463	171,300	3	19	22
Barton County:								
Ainsworth	190,285	511,260	489,332	468,460	426,700	1	58	67
Beaver-Feltes	150,641	170,283	279,458	247,587	391,500	9	34	45
Beaver and North Feltes	*150,641*	*170,283*	*279,458*	*192,495*	*200,300*	*9*	*26*	*32*
				55,092	*191,200*		*8*	*13*
Bloomer-Stumps	1,779,175	1,562,089	1,578,444	1,784,447	2,331,200	50	222	252
Bloomer-Stumps	*1,630,277*	*1,424,241*	*1,460,088*	*1,651,896*	*2,101,300*	*41*	*202*	*222*
Breford (Ellsworth)	*148,898*	*138,568*	*118,356*	*125,694*	*216,900*	*9*	*18*	*28*
Heinz (Rice)				*6,857*	*13,000*		*2*	*2*
Kraft-Prusa-Krier	53,700	277,273	263,352	611,450	1,404,700		104	170
Kraft, W. Prusa	*53,700*	*277,273*	*259,272*	*515,259*	*1,197,100*		*91*	*139*
Krier			*3,725*	*79,254*	*153,200*		*12*	*23*
Harzman			*355*	*16,937*	*54,400*		*1*	*8*
Silica-Raymond	7,618,493	5,533,782	4,999,924	5,762,796	7,614,700	276	752	859
Silica-Ellinwood	*6,829,498*	*5,155,389*	*4,714,370*	*5,417,776*	*7,064,400*	*216*	*701*	*783*
Raymond	*709,726*	*319,226*	*223,998*	*279,993*	*450,900*	*58*	*42*	*64*
Wenke and West	*79,269*	*59,167*	*61,556*	*65,030*	*99,400*	*2*	*9*	*12*
Lanterman	41,023	56,225	43,350	44,729	104,200	1	6	10
Miscellaneous	290,158	162,159	455,200	187,878	428,800	28	45	44
Total	10,123,475	8,273,071	8,109,060	9,107,350	12,701,800	365	1,221	1,447
Clark County:								
Morrison	25,469	35,668	31,211	19,016	12,700	1	2	2
Ellis County:								
Bemis-Walters	2,183,745	2,825,745	2,880,709	3,419,484	4,865,700	43	436	489
Bemis-Shutts-Cress	*1,933,849*	*2,469,912*	*2,544,110*	*2,912,011*	*4,187,000*	*41*	*373*	*421*
Hadley		*3,252*		*1,423*	*500*		*1*	*1*
Koblitz	*1,745*	*250*	*2,508*	*40,899*	*86,600*		*8*	*8*
Marshall	*83,132*	*130,819*	*104,132*	*115,433*	*182,100*	*1*	*15*	*17*
Walters	*165,019*	*221,512*	*229,959*	*349,718*	*408,500*	*1*	*41*	*42*
Burnett	1,288	36,485	254,170	1,771,295	3,291,000	1	137	192
Burnett and South		*25,559*	*208,792*	*1,755,315*	*3,276,000*		*134*	*189*
Haller	*1,288*	*2,305*	*1,560*	*1,283*	*800*	*1*	*1*	*1*
Richards		*8,621*	*43,818*	*14,697*	*14,200*		*2*	*2*
Blue Hill	7,864	30,545	42,880	96,910	196,300		16	19
Ruder	170,080	101,468	82,955	64,998	62,500	16	12	12
Solomon	23,484	1,860	4,280	42,875	41,500	1	3	3
Ubert	17,950	28,093	51,555	25,373	30,200	1	5	5
Miscellaneous	224,286	91,522	150,914	111,200	147,500	12	14	20
Total	2,628,697	3,115,718	3,467,463	5,532,135	8,633,700	74	623	740
Ellsworth County:								
Stoltenberg-Wilkins	285,334	274,303	404,819	1,056,018	1,426,700	44	186	231
Haiken	*26,400*	*20,483*	*23,413*	*17,087*	*10,500*	*6*	*4*	*3*
Wilkins		*17,043*	*170,843*	*359,478*	*737,700*	*4*	*43*	*62*
Stoltenberg-Stratman	*258,934*	*236,777*	*210,563*	*679,453*	*1,678,500*	*34*	*139*	*166*
Lorraine	1,635,220	816,763	601,126	534,696	461,400	93	91	89
Miscellaneous	51,510	18,438	14,928	12,280	11,600	2	1	1
Total	1,972,064	1,139,504	1,020,873	1,602,994	2,899,700	139	278	321
Harvey County:								
Halstead	420,373	233,368	182,355	132,514	114,800	11	21	20
Hollow-Nikkel	1,112,094	773,373	737,839	511,007	513,100	133	107	90
Sperling	26,465	74,328	61,472	43,300	50,600	4	7	8
Total	1,558,932	1,081,069	981,666	686,821	678,500	148	135	118
Finney County:								
Nunn		19,145	34,799	34,000	26,900		2	2
Graham County:								
Morel			20,657	94,148	110,000		6	6
Penokee				150	10,300		1	1
Gettysburg					421			1
Total			20,657	94,298	120,300		7	8
Kearny County:								
Patterson					6,000			2
Kingman County:								
Cunningham	221,984	217,488	259,390	287,385	480,000	37	57	80
McPherson County:								
Bornholdt-Welch	112,370	173,106	197,762	1,028,628	5,286,700	31	46	179
Bornholdt and North	*1,647*	*9,001*	*61,232*	*917,851*	*1,680,800*		*14*	*151*
Welch and North	*110,723*	*164,105*	*136,530*	*110,777*	*102,300*	*31*	*32*	*28*
Chindberg	110,558	152,418	121,740	95,576	84,100	23	31	30
Garber-Hesston	1,233,039	1,082,396	965,229	946,986	951,100	50	132	136
Johnson	174,000	91,603	95,035	82,985	87,300	19	16	16
Ritz-Canton	1,872,350	1,650,057	1,753,285	1,372,746	1,365,900	270	264	248
Roxbury		560	50,862	117,473	320,800		27	37
Voshell	931,247	764,860	574,112	562,389	585,500	121	102	101
McPherson	113,507	77,455	77,460	65,100	56,900	35	28	29
Miscellaneous	16,277	12,424	31,759	38,758	51,700	1	5	9
Total	4,563,348	4,004,879	3,867,244	4,310,641	5,286,400	550	651	785
Ness County								
Aldrich	2,164	32,545	58,837	124,147	116,500	2	13	13
Norton County:								
Hewitt					5,400			1
Pawnee County:								
Pawnee Rock and E.	7,728	27,325	44,257	51,471	162,600	1	9	24
Pratt County:								
Cairo			218	9,250	28,100		4	4
Iuka	2,921	17,589	24,048	34,800	56,700		5	7
Total	2,921	17,589	24,266	44,050	84,800		9	11
Reno County:								
Abbyville	53,138	37,655	27,705	25,900	36,900	4	4	7
Buhler	34,119	32,044	184,976	75,701	73,800		10	10
Burrton	5,384,129	3,520,991	3,186,631	2,624,896	2,539,300	324	442	425
Hilger	536,519	303,733	252,749	254,509	265,300	22	33	32
Lerado	802,797	378,660	293,842	271,216	259,900	13	33	33
Peace Creek					36,100			12
Yoder	15,134	13,551	10,823	6,500	3,100	5	5	5
Total	6,825,836	4,296,635	3,956,726	3,258,722	3,214,400	368	527	524
Rice County:								
Chase-Campbell	3,590,534	2,126,683	2,255,833	2,338,288	2,745,700	255	343	373
Chase	*2,945,230*	*1,767,824*	*1,507,988*	*1,687,805*	*2,009,400*	*215*	*261*	*267*
Campbell		*21,900*	*403,135*	*280,805*	*237,100*		*25*	*25*
Doran	*43,857*	*22,398*	*15,050*	*45,047*	*27,900*	*1*	*3*	*3*
Keesling	*601,447*	*314,561*	*293,971*	*275,321*	*411,700*	*39*	*48*	*63*
Midway			*35,689*	*49,310*	*59,600*		*6*	*11*
Geneseo-Edwards	1,291,673	1,426,789	1,752,965	1,814,082	2,694,300	45	223	277
Geneseo	*800,979*	*1,034,083*	*1,224,324*	*1,317,861*	*1,866,200*	*26*	*155*	*188*
Edwards	*490,694*	*392,706*	*528,641*	*496,221*	*828,100*	*19*	*68*	*89*
Haferman	163,284	61,944	61,519	73,916	85,900	6	10	10
Orth and East	97,669	74,646	66,154	85,335	109,300	7	14	15
Ploog-Rickard	152,122	80,687	91,255	76,616	86,500	11	11	14
Ploog	*138,870*	*72,745*	*84,475*	*69,609*	*75,800*	*10*	*10*	*10*
Rickard	*13,252*	*7,942*	*6,780*	*7,007*	*10,700*	*1*	*1*	*4*
Wherry and East	59,158	1,419,439	1,261,879	1,354,745	1,092,900	4	211	203
Miscellaneous	2,633,117	107,438	214,306	56,626	82,700	41	9	18
Total	8,320,890	5,297,626	5,703,911	5,804,608	6,897,300	369	821	910
Rush County:								
Otis-Albert	296,684	530,721	620,202	451,786	253,100	10	33	40

(Continued on Page 170)

olind drilled two more wells, the third of which was still not completed at year's end. The company also drilled a test just across the Colorado line, but failed to find production and was expected to turn farther south in either Kansas or Oklahoma for similar prospecting of the basin.

At the other end of the state, the McLouth area in Jefferson and Leavenworth counties had a lively play in what also was rank territory until the discovery of oil near McLouth during the Forest City basin play. Most of the wells found gas, and oil was a heavy black crude, but operators drilled 33 wells during the year.

Perhaps one of the most notable of all the state's developments was that in the Zenith area of western Reno County and eastern Stafford County. This pool is unique in western Kansas and is a stratigraphic Viola lime trap with excellent flowing wells completed in both the Viola lime and the overlying Misener sand. On the strength of some of the 80 new wells drilled there during the year, an exploratory campaign got under way to locate an extension of the shore line.

In August, the Peace Creek pool in Reno County apparently located the trend to the northeast. Eighteen oil wells were drilled at Peace Creek by the end of the year and two new pools or extensions were opened. They were Peace Creek, Northeast, and the Hendrickson pool (see discovery table), both of which were expected to prove extensions to Peace Creek rather than new pools.

Thus, in all areas, Kansas had excellent results from both field drilling and wildcatting and as the year closed, the state had excellent prospects for continued development in the far west, along the Barton arch as far north as the Nebraska line, and in the south along the Zenith-Peace Creek trend. The Kansas sector of the Anadarko basin was also drawing attention as a result of Simpson sand strike in the Lake City pool of Barber County (see discovery table.)

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PRODUCTION—WESTERN

	1937	1938	1939
Otis	*219,944*	*419,241*	*445,390*
Albert	*76,740*	*111,480*	*174,812*
Winget	23,531	12,373	3,300
Total	320,215	543,094	623,502
Rooks County:			
Dopita	22,989	13,061	36,970
Laton	13,395	47,326	105,720
Westhusin	46,257	113,202	85,990
Miscellaneous	50,019	26,627	33,690
Total	132,600	200,516	262,370
Phillips County:			
Bow Creek	.....	.....	3,525
Ray	.....	.....	.....
Miscellaneous	.....	.....	.....
Total	.....	.....	3,525
Russell County:			
Atherton-Russell	903,716	597,950	498,927
Atherton and(Nobud)	*92,811*	*136,027*	*138,454*
Russell	*810,905*	*461,923*	*360,473*
Big Creek-Vaughn	721,363	631,058	547,802
Big Creek and East	*466,337*	*298,726*	*272,061*
Neidenthal	*150,551*	*94,019*	*68,753*
Vaughn	*104,475*	*238,313*	*206,988*
Fairport	808,386	673,376	644,788
Gorham	3,546,417	2,585,827	2,081,470
Greenvale and N W	.....	11,747	53,437
Hall-Gurney	594,100	613,259	1,210,509
Trapp-Sellens	4,105,406	4,162,149	4,255,451
Eichman	*153,130*	*84,820*	*40,217*
Fairfield and North	.....	.....	*39,752*
Karst	(*)	*17,934*	*28,600*
Sellens	*318,078*	*222,763*	*187,645*
Trapp and West	*3,634,198*	*3,836,632*	*3,959,237*
Miscellaneous	785,692	580,955	445,894
Total	11,465,080	9,856,321	9,738,288
Scott County			
Shallow Water	103,182	342,449	257,748
Sedgwick County:			
Eastborough and North	268,844	247,659	228,885
Goodrich	188,864	266,707	266,296
Greenwich	443,881	367,135	285,024
Robbins	222,384	149,620	118,680
Valley Center	405,780	353,845	320,389
Miscellaneous	15,517	33,027	27,862
Total	1,545,270	1,417,993	1,247,136
Stafford County:			
Drach-Fischer-Gates	52,373	146,757	201,385
Drach	*1,690*	*68,755*	*71,409*
Fischer	.....	*6,939*	*30,775*
Gates	*50,683*	*71,063*	*99,201*
Leesburgh	.....	.....	26,832
Richardson	724,161	527,591	457,175
Sittner-Max	2,927	86,755	169,615
Sittner and South	*2,927*	*86,278*	*111,481*
Max	.....	*477*	*58,134*
St. John	171,627	160,360	157,778
Zenith	.....	365,484	1,293,720
Snider and South	56,853	29,040	28,986
Stafford	.....	.....	.....
Miscellaneous	90,218	40,944	32,019
Total	1,098,159	1,356,931	2,367,510
Sumner County			
Churchill	314,184	252,808	197,611
Latta	37,662	40,457	96,050
Oxford and West	652,290	454,296	317,443
Wellington	1,154,937	768,800	679,648
Caldwell	45,330	52,789	66,942
Padgett	96,837	81,270	77,686
Miscellaneous	40,386	48,047	58,967
Total	2,341,626	1,698,467	1,494,347
Trego County:			
Miscellaneous	122,801	94,941	53,796
Total Western	53,443,739	43,164,850	43,723,430

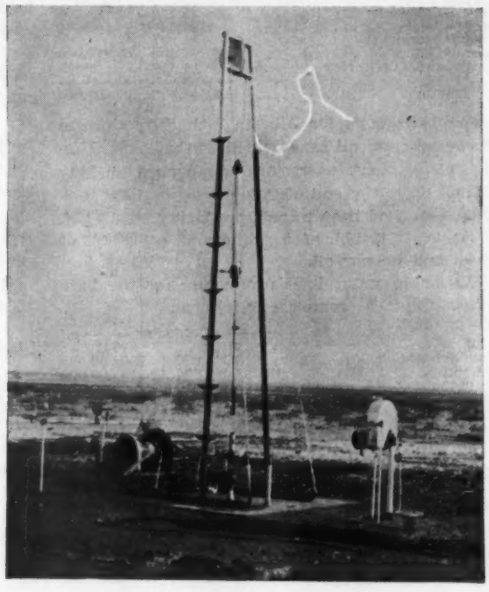
EASTERN

Butler County:			
Leon-Weaver	533,264	459,809	440,558
Garden	*85,625*	*73,497*	*70,573*
Haverhill	*112,756*	*96,324*	*82,924*
Kramer	*78,111*	*64,389*	*44,895*
Leon-Weaver	*41,260*	*39,495*	*32,850*
Reynolds-Schaffer	*131,440*	*114,753*	*118,290*
Stern	*84,072*	*71,351*	*91,026*
Augusta and North	542,207	501,193	448,958
Brandt	6,137	70,090	110,047
Douglas	27,604	27,047	25,550
Elbing	467,418	490,553	412,799
El Dorado	3,340,426	3,022,773	2,709,619
Fox-Bush	167,691	157,477	136,192
Potwin	417,331	343,942	272,716
Young	37,568	34,888	79,205
Keighly-Blankenship	91,500	177,514	139,985
McCullough	(*)	135,531	69,158
Smock-Sluss	67,437	63,591	56,824
Miscellaneous	290,853	209,394	161,697
Total	5,989,436	5,693,802	5,063,308
Coffey County:			
Van Noy	48,929	28,809	24,305
Cowley County:			
Couch	(*)	(*)	(*)
David and South	84,930	74,329	152,700
Frog Holow	33,435	44,861	214,215
Hittle	26,402	145,511	1,132,129
Rainbow Bend	463,972	483,570	464,217
Rainbow Bend & W.	*409,674*	*427,492*	*370,103*
Geuda Springs	*54,298*	*56,078*	*94,114*
Rock & North & East	34,959	150,068	161,518
Weathered	337,336	680,637	484,563
Winfield-State	271,733	226,921	1,938,822
Burden	131,695	92,631	69,562
Darien	.....	.....	64,240
Eastman	35,621	69,228	53,290
Slick-Carson	67,691	62,982	56,735
Trees	88,822	71,496	70,080
Others	385,998	215,984	146,133
Total	1,962,594	2,318,218	2,131,075
Elk County:			
Miscellaneous	400,270	279,098	244,750

KANSAS (Continued)		Number of wells		
1940	1941	1-1-37	1-1-41	1-1-42
288,370	*131,300*	*6*	*19*	*22*
163,416	*121,800*	*4*	*14*	*18*
12,373	1,600	.....	1	1
464,159	254,700	10	34	41
28,800	55,300	3	5	8
219,100	518,000	3	38	68
73,600	80,700	1	11	12
21,452	30,700	5	8	9
342,952	684,700	12	62	97
7,400	7,100	.....	1	1
8,000	175,300	.....	4	24
.....	4,400	.....	.....	2
15,400	186,800	.....	5	27
621,684	636,600	47	87	88
266,568	*210,400*	*4*	*38*	*38*
353,116	*426,200*	*43*	*49*	*50*
592,324	798,300	31	95	115
340,498	*521,600*	*17*	*58*	*78*
48,659	*39,100*	*14*	*10*	*9*
203,167	*237,600*	.....	*27*	*27*
635,434	573,700	153	144	147
2,176,114	2,426,400	117	306	314
90,265	212,600	.....	15	34
2,242,762	3,520,200	77	305	412
5,480,955	7,576,700	91	726	830
36,791	*34,500*	*14*	*9*	*9*
57,321	*89,700*	.....	*9*	*10*
28,670	*24,400*	*5*	*5*	*4*
171,490	*177,800*	*24*	*26*	*26*
5,186,683	*7,250,300*	*48*	*677*	*781*
593,000	178,200	84	45	36
12,432,538	15,922,700	600	1,628	1,976
158,672	127,300	3	8	9
186,547	187,000	49	45	46
237,576	257,100	14	34	35
249,720	242,300	43	42	42
98,363	77,700	55	52	52
368,324	313,300	80	67	66
15,958	15,100	8	7	7
1,156,488	1,092,500	249	247	248
199,594	240,400	4	25	28
71,649	*97,200*	.....	*9*	*12*
39,563	*35,200*	.....	*5*	*5*
83,382	*108,000*	*4*	*11*	*11*
125,531	131,000	.....	9	9
498,189	528,600	27	60	60
209,037	324,300	.....	30	35
164,697	*254,600*	.....	*25*	*26*
44,340	*69,700*	.....	*5*	*9*
174,570	246,700	2	20	23
1,838,206	3,176,300	.....	232	295
66,361	106,200	4	13	13
18,900	168,200	.....	4	16
68,273	418,000	.....	17	38
3,198,661	5,339,700	37	410	517
179,185	156,200	71	63	62
88,727	84,100	5	11	12
238,260	201,800	93	48	48
507,306	334,900	53	98	98
61,117	66,600	4	4	4
73,244	69,000	21	20	20
71,799	64,100	2	8	9
1,219,638	976,700	249	252	253
47,893	42,600	10	8	8
50,116,502	66,126,000	3,227	7,028	8,174
KANSAS				
446,835	523,200	197	178	188
64,805	*66,500*	*32*	*30*	*31*
99,284	*175,700*	*66*	*63*	*67*
44,518	*41,200*	*22*	*17*	*17*
29,525	*29,400*	*36*	*26*	*26*
113,301	*107,200*	*30*	*25*	*27*
95,402	*104,200*	*11*	*17*	*20*
425,043	460,500	257	212	218
215,216	211,400	1	37	40
48,455	131,000	28	29	36
399,746	365,500	83	74	74
2,651,409	2,597,000	1,839	1,626	1,568
130,922	124,900	189	152	149
249,915	238,400	65	79	90
82,062	76,300	17	33	31
134,445	138,700	142	140	143
53,103	37,600	3	8	8
58,713	70,700	46	42	43
149,247	253,500	45	58	68
5,045,111	5,229,700	2,912	2,668	2,656
34,875	21,400	31	37	62
34,232	143,200	.....	10	17
90,089	132,100	13	27	30
177,469	238,700	.....	24	37
840,801	834,800	14	72	73
388,450	371,200	118	129	128
353,805	*339,300*	*116*	*118*	*117*
34,645	*31,900*	*2*	*11*	*11*
189,879	221,000	19	40	42
193,033	164,600	9	29	29
214,568	159,800	118	94	90
59,202	51,400	36	33	32
44,781	49,500	.....	6	6
45,659	50,400	34	33	33
61,919	63,100	21	18	16
53,438	38,600	9	10	10
277,378	284,000	137	132	129
2,671,798	2,802,400	528	657	672
303,436	369,100	222	281	281

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Greenwood County:								
Pixley	651,787	713,899	624,848	617,689	165,400	96	96	93
Sallyards	492,216	461,693	405,896	479,601	131,400	137	132	133
Virgil-Dunaway	640,412	637,157	662,636	629,785	170,400	465	470	445
Lamont	140,371	137,516	125,110	126,501	125,400	113	108	111
Quincy	412,542	372,941	290,756	204,811	161,800	79	115	114
Winterscheid	300,388	266,828	247,256	230,026	219,300	211	226	222
Beaumont	.....	.....	(*)	77,629	164,100	.....	13	19
Seeley-Wick	936,520	901,560	832,058	804,917	894,600	665	652	653
DeMalorie-Sowder	*170,650*	*184,948*	*227,438*	*251,204*	*286,000*	*130*	*126*	*129*
Hamilton	*151,548*	*131,333*	*111,873*	*110,411*	*113,900*	*92*	*96*	*92*
Madison	*249,888*	*228,134*	*198,729*	*181,215*	*176,800*	*111*	*102*	*103*
Seeley-Wick	*364,234*	*357,145*	*294,018*	*262,087*	*317,800*	*332*	*328*	*329*
Reese	.....	.....	47,926	47,500	44,700	.....	22	27
Willard	.....	.....	14,965	8,200	60,700	74	70	67
Miscellaneous	432,492	342,856	296,500	214,057	1,480,400	973	935	953
Total	4,006,728	4,113,548	3,792,701	3,226,659	3,238,300	3,035	3,120	3,118
Marion County:								
Lost Springs	100,911	118,078	206,400	369,574	673,200	54	75	114
Miscellaneous	246,723	201,726	170,929	177,812	184,400	101	85	60
Total	347,634	319,804	377,329	547,386	857,600	155	160	174
Eastern Counties:								
Miscellaneous	2,554,670	2,514,585	2,772,333	3,100,565	3,450,400	6,716	6,704	6,701
Total Eastern Kansas	14,909,991	14,988,766	14,405,801	14,929,830	16,295,100	13,499	13,627	13,664
Total Kansas	68,353,730	58,153,616	58,129,231	65,046,332	82,421,100	16,726	20,655	21,838

NIXON
SURFACE CONTROL GAS-LIFT SYSTEM



Conserves Money, Metal, Machinery

The Nixon Gas-Lift CONSERVES MONEY AND LABOR by its economical, efficient operation, which reduces fluid-lifting to its lowest possible cost.

It CONSERVES METAL AND MACHINERY by eliminating elaborate and heavy equipment . . . by putting nature's own power (gas pressure) to work in lifting the fluid to the surface.

Aid your nation . . . help defense . . . save on vital metals and machinery . . . reduce operating expense and labor . . . put Nixon Surface Control Gas-Lift System on your wells now. Call in one of our engineers. Write the nearest Wilson Supply Company store or sales office.

The following patents have been issued on the Nixon Surface Control Gas-Lift System: 1,735,025; 2,132,081; 2,136,457; 2,153,770; 2,164,469; 2,171,812; 2,171,478; 2,171,479; 2,171,480; Re 21,199; 2,202,462; 2,204,817; 2,217,072; 2,245,002; 2,245,003; 2,245,004; 2,245,005; 2,245,006; 2,245,007; 2,245,008; 2,245,009; 2,245,010. Other patents pending.

WILSON SUPPLY COMPANY

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North Turner Valley Raises Canadian Production Record

By VICTOR LAURISTON

CANADIAN petroleum production in 1941 showed a substantial gain over the previous peak production of 1940, with a total for the year of 10,107,000 bbl. compared with the 1940 total of 8,590,978 bbl. This is an increase of 1,516,022 bbl.

Comparative figures for the various Canadian provinces are:

Province—	Barrels 1940	Barrels 1941
New Brunswick	22,167	23,000
Ontario	187,644	156,000
Saskatchewan	331	.....
Alberta	8,362,203	9,914,000
Northwest Territories	18,633	14,000
Total	8,590,978	10,107,000

The 1941 totals for Alberta include production recovered from oil sand mined in that year. Mining and recovery operations commenced on May 19, and up to the end of October some 21,731 tons of oil sand had been mined, producing 19,519 bbl. of crude, 1,142 bbl. of gasoline and 4,190 bbl. of diesel and burner oil.

Figures of natural-gas production for the individual provinces compare as follows:

	Cubic feet 1940	Cubic feet 1941
New Brunswick	616,041,000	666,000,000
Ontario	13,053,403,000	12,513,000,000
Manitoba	600,000	600,000
Saskatchewan	100,773,000	103,000,000
Alberta	27,459,808,000	25,771,000,000
Northwest Territories	1,500,000	1,500,000
Total	41,232,125,000	39,055,100,000

The increased crude production in 1941 was largely due to Alberta development, and this in turn was due largely to more intensive drilling in Turner Valley. The outlying pools, however, made a more substantial contribution to the total production for the province than in 1940.

PRODUCTION FROM ALBERTA FIELDS

	Barrels 1940	Barrels 1941
Turner Valley limestone crude	8,097,414	9,506,689
Turner Valley shallow crude	7,309	6,190
Turner Valley naphtha	75,602	26,205
Turner Valey natural gasoline	272,202	285,851
Red Coulee light crude	12,177	11,773
Wainwright heavy crude	12,273	11,615
Del Bonita light crude	3,246	5,236
Lloydminster heavy crude	1,576	416
Steveville light crude	.....	19,337
Taber medium crude	.....	5,155
Vermilion heavy crude	9,256	20,799
Dina-Ribstone heavy crude	5,146	2,894

The year was exceptionally active for drilling, and closed with 199 crude producers, of which 176 were in Turner Valley. This is an increase of approximately 60 producers over the previous year.

Turner Valley continued to be the chief center of drilling activity. In general, the trend of the field was northward. In the original west flank crude area, in Township 18, activity was limited largely to two new wells drilled by Northwest-Hudson's Bay in Section 8-18-2w5. Of these No. 6 proved a large producer, and may indicate a possible extension of the field to the southwest.

There was considerable drilling in the west-central section. In the northern part of this area the field was further delimited by the completion of two dry holes, Empress Royalties 1 LSD 5, 2-20-3w5, and Harris Royalties 3, LSD 16, 3-20-3w5, the latter getting salt water in the upper lime at 8,927 ft. and the former being abandoned at 8,787 ft. with the Madison at 8,675 ft. These were the only dry holes completed in Turner Valley in the course of the year; though some of the new completions in the older sections of the field were comparatively small producers.

The most important development was the extension of the producing area considerably north of its previous limits, securing some of the largest producers in the history of the field, and indicating the possibility of yet farther extensions. At the end of 1940, the most northerly producer was Alberta Oil Incomes 2, LSD 4, 4-21-3w5. At the end of 1941, Major Oils 3, LSD 1, 8-21-3w5, had been finished, approximately a mile farther north and west, with initial allowable of 1,165 bbl. daily. Several large producers have recently been finished in the same general area, and drilling has now been undertaken as far north as Major Oils 11, LSD 12, 9-23-4w5, approximately 13 miles north of Major 3 producer.

Throughout the year the Alberta Conservation Board has stabilized Turner Valey crude allowables, at 26,000 bbl. daily, this representing the regular conservation allowables plus a war emergency allotment. Actual limestone crude production, however, slightly exceeds this figure, with a daily average of 26,440 bbl.

Steveville Field

Early in 1941 Standard Oil Co. of British Columbia 2 Princess, LSD 3, 13-20-12w4, was definitely recognized by the Alberta Conservation Board as a producer, opening a new crude area approximately 110 miles east of Calgary. This well, completed at 3,290 ft. with an initial production of 520 bbl. daily of 26.3-gravity crude, with 12,750,000 cu. ft. of gas, later developed production difficulties due to water intrusion, but has since been put on steady production and contributed most of the 19,337 bbl. of crude produced from the Steveville-Princess field in 1941. Several other tests proved unsuccessful, but toward the close of the year Standard 6 Princess, LSD 5, 27-20-12w4, finished above the lime at 3,190 ft. with a flow estimated around 100 bbl. daily. Development work is to be continued.

In the course of the year the Vermilion shallow crude area in east-central Alberta, opened in 1940, moved into second place among Alberta fields. Operations in this field have been stimulated by a demand for fuel oil, and a processing plant is now being completed to treat the heavy crude, for which, under previous conditions, it was difficult to find any large market. Drilling has proven a large area where production can be secured at 1,800 to 1,900 ft. and as the cost of drilling is much less than in Turner Valley, widespread development is expected for 1942.

The demand for crude oil, emphasized by gasoline restrictions, stimulated wildcatting to some extent during 1941. So far, outside the Steveville-Princess area, results have been rather negative. On the Moose dome structure, McColl-Frontenac 1 deep test, LSD 9, 6-23-6w5, was abandoned at around 5,200 ft. In the border fields Northwest Co., subsidiary of Imperial Oil, drilled two tests on the Blood Indian Reserve, long regarded as a promising oil prospect. Northwest 1, LSD 3, 20-5-23w4, was drilled to 8,082 ft. to test the Devonian limestone, and failed to get production. Northwest-Treaty 1, LSD 4, 17-8-23w4, got the Madison at 5,960 ft. and was abandoned at 6,074 ft. In the Lethbridge area. Lethbridge Petroleums 1, LSD 12, 11-8-22w4, finished at 4,386 ft. after getting the Madison at 4,145 ft. with good oil shows but had to be abandoned owing to water troubles. The most encouraging result secured was on the Twin River structure where Western Drilling 1, LSD 16, 3-2-20w3, finished in the Madison at 3,969 ft., is producing from 30 to 50 bbl. daily. Considerable new wildcatting is foreshadowed for 1942 with several important tests already under way.

Ontario Drilling

In Ontario, a prospective shortage of natural gas, due to heavy demands from war industries, resulted in one of the most active drilling campaigns in the recent history of the province, with a view to developing new gas reserves. In addition to a few wildcats, the Union Gas Co. carried on extensive operations in proven or semiproven fields. Completions include 10 dry holes and 5 producers in Chatham Township, with aggregate initial flow about 3,500,000 cu. ft. daily. In the Malahide field the same company completed three dry holes and about eight gassers, while Central Pipe Line Co. completed two gassers in the same area.

Wildcatters Find Many Small Pools in Indiana

THE extensive wildcatting campaign carried on in southwestern Indiana for the past several years finally paid off during the latter part of 1941 with the discovery of some of the best pools in the state since the opening of the Griffin pool. Continued development of the Griffin pool, however, accounted for the major part of the state's activity and nearly 60 per cent of the completed oil wells were in this and the New Harmony fields. The Heusler and Bufkin pools producing from the Chester sands in Posey County also were extended during the year.

Wildcatting was more successful than usual during the year with 45 successful tests out of a total of 187 completed. Of these, 28 were oil wells while 17 were gassers. Most of the finds were small and all of the year's development failed to maintain production at the high rate prevailing at the start of the year.

Summary of Wells Completed During 1941

Field—	Comp.	Oil	Prod.	Gas	Dry
Bowman	3	3	80	0	0
Bufkin	10	8	626	0	2
Bufkin, South	17	14	636	1	2
Cannelburg	12	7	79	0	5
Dodd's Bridge	1	1	5	0	0
Griffin	142	128	17,460	0	14
Hatfield	7	4	340	0	3
Hazleton	3	2	350	0	1
Heusler	17	13	642	0	4
Hudsonville	4	0	0	2	2
Iva	1	0	0	1	0
Loogootee	1	0	0	1	0
Merom & Raley	6	0	0	1	5
Mount Vernon	5	5	1,389	0	0
New Harmony	25	25	3,724	0	0
Oakland City	2	0	0	0	2
Oaktown	1	0	0	0	1
Oatsville	1	1	4	0	0
Patoka	1	1	93	0	0
Point	4	3	245	0	1
Rockport	3	1	16	2	0
St. Wendell	2	1	20	0	1
Sioal	1	1	100	0	0
Shelburn	2	1	6	0	1
Somerville	2	0	0	0	2
Sullivan	4	0	0	2	2
Trenton	14	1	6	13	0
Troy	7	4	34	0	3
Vanderburg	1	1	10	0	0
Veale	4	2	44	1	1
Vienna	4	4	100	0	0
Wheeling	1	1	50	0	0
Wildcats	187	28	2,494	17	142
Miscellaneous	18	2	63	7	9
Total 1941	513	262	28,616	48	203

Completions by Months

	Comp.	Oil	Gas	Dry	Footage
January	38	25	5	8	80,172
February	25	13	3	9	49,971
March	34	20	1	13	69,286
April	46	22	4	20	83,368
May	40	23	1	16	76,909
June	35	13	4	18	69,638
July	63	35	6	22	126,962
August	44	22	4	18	83,455
September	41	21	4	16	76,010
October	47	21	5	21	71,458
November	49	18	7	24	71,309
December	51	29	4	18	80,553
Total	513	262	48	203	939,091

DEEP PAYS AND NEW FIELDS IN NORTH WILL KEEP BASIN ACTIVE

By D. H. STORMONT

MIDLAND, Tex.—Development in West Texas during the past year centered largely around exploration of deeper pay horizons. In the North Permian basin activity outside of proven areas was directed toward extending productive limits northward and eastward from the Slaughter pool, northernmost field in the area. In this section most of the wildcatting was projected to the San Andres and Clear Fork pays of the Permian series, comparatively new productive horizons for the area which have had but little development. In the south basin, wildcatting to a great extent was associated with the trend of Lower Ordovician pools established in Crane and northeastern Pecos counties.

For the area as a whole drilling increased by some 440 wells to the total of 2,297 completions for the year. Of this total, almost one-third was in the Slaughter field; majority of the remainder was in fields that have been under development for several years.

A total of 102 wildcats were drilled, resulting in the opening of 13 new fields or possible major extensions, all but two of which were located in

DISCOVERIES IN WEST TEXAS DURING 1941

Field, county, discovery well—	Location—	Date	Initial prod. (bbl.)	Depth	Number of wells 1-1-42	Producing horizon—Remarks
North Cowden, Ector, Stanolind 3-A Midland Farms	Sec. 46, Blk. 42, Twp. 1n, G.&M.M.B.&A. Sur.	1/29	272 (*)	4,465-4,621	14	L. Double Mountain; deeper pay for field
Baldwin, Menard, Harry Baldwin 1 Leggett	Sec. 1, B.S.&F. Sur., 7 mi. NE Menard	1/30	2 M.c.f. gas	1,250-52	1	Lime pay
West Andrews, Ector, Phillips 1-A Embar	Sec. 6, Blk. 44, Twp. 1n, T.&P. Sur.	2/1	34	4,210-4,312	6	Big lime; 3 mi. S of gas disc. in Andrews County
Bean, Crockett, Wahlenmaier Pet. 1 Bean	Sec. 48, Blk. UV, G.C.&S.F. Sur., 12 mi. NW Ozona	2/19	196 in 22 hr.	1,451-56	1	Upper Permian sand
Sand Hills, S. Extension, Crane, Gulf 17 Waddell	Sec. 15, Blk. 3, H.&T.C. Sur., 5 mi. SW Sand Hills	3/21	1,242	5,635-48	3	Ellenburger lime, Ordovician
Rhodes, Cochran, Atlantic-Rhodes Drlg. 1 Dean	Tract 4, L. 89, Lipscomb C.S.L. Sur., 2 mi. SW of Slaughter field	3/26	264 (*)	5,010-50	1	San Andres lime (Permian)
Heiner, Pecos, Culberson & Irwin 1 Heiner	Sec. 589, G.C.&S.F. Sur., 9 mi. W of Apco field	3/1	36	5,382-5,509	1	Ellenburger lime, Ordovician
Abell, Pecos, Magnolia 1 State-Sharp	Sec. 22, Blk. 9, H.&G.N. Sur.	3/28	92 (*)	5,920-45	6	Waddell sand of lower Simpson; deeper pay
Ownby, Yoakum, Geo. Livermore 1 Ownby-Shell	Sec. 502, Blk. D, Gibson Sur., 3 mi. N of Waples-Platter field	4/3	520	5,251-63	4	Big lime, Permian
West Fuhrman, Andrews, Fuhrman Pet. 1 Lockhart-Brown	Sec. 24, Blk. 42-A, P.S.L. Sur., between Deep Rock and Fuhrman fields	5/9	20, 12% S.W.	4,248-4,458	4	Big lime, Permian
Spencer, Ward, Stanolind 1 Spencer-Evans	NW NW Sec. 53, Blk. 34, H.&T.C. Sur.	7/2	225 oil, 216 S.W.	2,925-90	4	Permian lime; 2½ mi. W of Estes field
Abell-Permian, Pecos, Stanolind 1 Conry-Davis	Sec. 31, Blk. 9, H.&G.N. Sur., 4 mi. E Abell Ord.	7/16	346	3,710-3,810	6	Tupb pay, Permian
Abell, Pecos, Magnolia 1 J. F. McKee	Lot 13, Sec. 25, Blk. 9, H.&G.N. Sur.	8/5	62 oil, 54 S.W.	5,914-40	1	Ellenburger; deeper pay for field
South Apco, Pecos, Anderson-Prichard 1 Boren	NE SE Sec. 4, Blk. 605, L. Merchant Sur., 2 mi. S of Apco field	8/8	1,141	4,666-4,791	1	Ellenburger, Ordovician
Clara Couch, Crockett, R. H. Henderson 1 Shell-Couch	NW NE Sec. 37, Blk. GG, H.E.&W.T. Sur., 9 mi. SE of Noelke field	8/24	352	2,166-83	1	Permian lime
Barnhart, Reagan, Amerada 1 RA University	SE NE Sec. 3, Blk. 48, University Lands Sur., 20 mi. SE of Big Lake	9/5	189 in 4 hr.	9,010-80	2	Upper Ellenburger
Todd Deep, Crockett, Amerada et al 1-C Todd	SW SW Sec. 15, Blk. 10, G.C.&S.F. Sur.	9/26	87 oil, 219 S.W.	6,439-49	1	Crinoidal lime (Strawn); new deep pay or extension
Lubbock, Lubbock, L. C. Harrison 1 Nairn estate	SE SE Sec. 25, Blk. A, John Gibson Sur., 35 mi. NE of Slaughter pool	11/5	165, plus 5% wtr. (*)	4,884-5,002	1	Clear Fork lime (Permian); first prod. for county.
Abell, Pecos, Stanolind 1 Rathjen	Lot 14, Sec. 26, Blk. 9, H.&G.N. Sur., 3½ mi. NW of Abell-Permian field	11/7	759	3,885-3,950	1	Upper Clear Fork (Permian); new pay level for field
Sand Hills, Crane Extension, Continental 1 E. B. Jones	NE NE Sec. 12, Blk. 3, H.&T.C. Sur., 5 mi. SW of Sand Hills field	11/8	83	5,720-40	1	Waddell sand of Simpson; shallower Ordovician pay
Weiner, Winkler, Ted and Sam Weiner 1-B Halley	NW NE Sec. 7, Blk. B-11, P.S.L. Sur.	11/11	370	3,005-3,205	1	Colby sand (Permian); 1 mi. east of Halley pool
Abell-Permian, Pecos, Magnolia-Geo. Abell 1-B Myrick-State	Sec. 31, Blk. 9, H.&G.N. Sur.	12/6	194	2,250-2,300	1	Permian; shallower pay for pool
Wasson, Andrews, A. G. Carter 4-D Wasson	NW SE Sec. 50, Blk. AX, P.S.L. Sur.	12/18	510	7,055-7,200	1	Permian lime; deepest pay for pool
Wentz, Pecos, Gulf-L. H. Wentz 2 Millar	NW SE Sec. 43, Blk. 11, H.&G.N. Sur.	12/20	263	4,363-83	1	Ellenburger, Ordovician
Clara Couch, Crockett, Humble 1 Owens	SW SE Sec. 8, Blk. GG, H.E.&W.T. Sur.	12/22	109	1,903-2,003	1	Permian lime; shallow pay NW of 1-well Clara Couch pool
Wright, Cochran, Bieg Oil (was O'Neal & Wheeler) 1 Wright	Labor 12, League 60, Martin C.S.L., 3½ mi. N of Slaughter field	....	9 an hr., cut 28%, testing	4,950-83	1	San Andres lime; may prove to be extension of Slaughter
Unnamed, Dawson, Albaugh-Richmond Drlg. 1 J. S. Handley	SE SW Sec. 36, Blk. M, E.L. Sur.	....	75, testing (*)	4,910-77	1	San Andres; 1½ mi. NE of aband. 2-well Scanlan pool

*Pumping.

PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

WEST TEXAS

Fields—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Wasson	13,169,988	36,082	880,678	821,963	950,577	1,009,181	1,142,038	1,120,942	1,082,836	1,153,306	1,113,986	1,236,859	1,247,991	1,390,391
Cowden-Foster	10,837,845	29,693	749,507	680,780	822,668	855,000	956,891	931,968	916,278	973,461	955,058	1,069,148	1,075,568	1,130,255
Hendrick-Kermit	10,009,846	27,424	765,338	711,808	863,496	843,501	883,730	831,639	830,366	838,222	806,282	860,891	849,094	883,259
Goldsmith-Harper	9,276,128	25,414	702,737	720,397	758,184	735,499	810,903	777,595	748,269	777,771	747,901	821,576	817,142	858,154
Yates-Tobarg	6,719,218	18,409	583,245	529,193	475,169	501,943	552,321	529,893	508,019	528,213	496,741	554,905	554,490	582,867
McElroy	4,819,290	13,204	302,613	318,991	386,403	376,619	422,300	409,338	390,491	403,273	403,667	418,362	458,287	503,315
Slaughter	4,808,092	13,173	92,851	106,347	171,928	243,822	301,873	337,153	398,925	501,030	544,967	626,591	708,253	804,452
Howard-Glasscock	4,735,003	12,973	411,882	370,322	407,521	394,250	406,733	391,233	401,756	398,224	385,528	394,085	375,997	400,265
South Ward-Estes	3,875,254	10,617	324,167	313,398	327,405	312,725	335,088	317,187	314,001	322,230	308,218	326,923	320,033	332,834
McCamey	3,788,745	10,379	310,460	279,324	323,427	309,961	329,016	314,598	311,506	319,517	309,019	325,716	323,091	333,050
Penwell-Waddell	3,659,025	10,025	253,602	251,462	290,199	299,318	329,459	312,474	303,341	313,173	305,696	329,613	328,995	343,593
North Ward-Sealy	2,791,025	7,647	206,007	208,382	220,262	216,155	238,834	228,462	225,515	239,580	231,414	257,418	254,170	263,721
Seminole	2,615,694	7,166	137,447	134,185	174,343	194,561	224,640	224,096	219,924	238,725	233,275	266,596	273,785	294,117
Big Lake	2,008,625	5,503	172,570	154,459	169,845	163,636	175,607	161,956	176,367	169,383	164,137	167,334	163,949	169,382
Iatan-Snyder	1,805,872	4,968	159,494	144,143	157,546	153,851	152,234	147,330	150,113	148,621	136,703	150,670	145,266	151,901
Means	1,295,327	3,549	79,619	71,601	98,465	108,233	118,964	113,972	109,712	115,876	110,646	121,251	121,659	125,329
Sand Hills	1,192,510	3,267	66,645	61,904	74,830	73,130	83,021	100,964	101,963	108,821	111,967	127,959	134,871	146,515
Tavlor Link	702,092	1,924	52,042	48,116	58,136	50,675	56,817	61,759	66,845	63,122	59,961	62,093	60,002	62,224
Fuhrman-Deep Rock	546,569	1,497	43,639	39,419	48,386	51,858	58,239	57,105	57,074	58,145	58,447	64,793	67,053	70,435
World	507,262	1,390	39,977	41,552	41,328	35,888	37,411	39,310	39,203	42,621	44,999	48,316	47,426	49,231
Payton	471,016	1,290	49,094	42,741	47,757	45,349	43,671	36,583	41,613	40,470	35,771	24,197	30,540	33,210
Pecos Valley	423,755	1,161	35,354	34,224	35,829	35,655	38,712	34,043	37,131	35,801	35,135	34,095	32,906	33,970
Sharon Ridge	417,679	1,144	27,041	24,084	31,272	31,779	35,635	34,249	38,436	37,401	37,233	39,833	38,566	39,950
Wheat	399,719	1,095	33,933	31,469	33,788	33,411	34,087	33,244	33,216	33,116	32,267	34,119	31,998	33,011

the southern portion of the area. As is shown in the accompanying table, however, 27 new discoveries were made during the year, numerically almost twice the total of any recent year. Thus it is readily apparent that West Texas operators met with as much success in establishing production from deeper pays in proven fields as in opening new fields. Of the new discoveries, only 5 were shallower than 2,500 ft., 11 were between 2,500 and 5,000 ft., and 11 were over 5,000 ft. deep. In the Wasson field a 7,000-ft. pay zone was opened at the close of the year, while in Reagan County a 9,000-ft. Ellenburger lime pool was opened to establish a new production depth for West Texas.

After many years of search the development of Ellenburger and Simpson pays has assumed widespread proportions in the south basin. A deep-seated structural trend has been established in southern Crane and northeastern Pecos counties on the platform between the two trends of Permian production on the rims of the platform. Previous to the start of 1941, Ellenburger and Simpson production had been found in the Sand Hills field of Crane County and Ellenburger production in the Abell and Apco fields of Pecos County. This year production from the Simpson and Ellenburger was opened in an area some 5 miles south of the Sand Hills Ordovician field, but separated from the latter by several dry holes. A one-well 5,500-ft. Ellenburger field was discovered 9 miles west of the Abell field. Another Ellenburger field was opened in northwest Pecos County at the comparatively shallow depth of 4,100 ft. and in the Abell field production was established both in the Simpson and in the basal Ellenburger.

Probably even more significant than any of the above Ordovician discoveries, however, was the finding of Ellenburger oil production near Barn-

SOUTHERN WEST TEXAS DISTRICT

Summary of Wells Completed During 1941

Field—	Comp.	Oil	Prod.	Gas	Dry
Abell	42	39	45,404	2	1
Abell-Permian	7	7	3,743	0	0
Apco-Warner	5	3	4,047	0	2
Bean	1	0	0	0	1
Big Lake	1	1	77	0	0
Cowden-Crane	6	6	1,895	0	0
Crockett	11	10	1,447	0	1
Dune	9	9	3,540	0	0
Duro	1	1	162	0	0
Emperor	3	3	1,171	0	0
Estes	12	11	7,866	0	1
Foster	111	106	130,140	0	5
Fromme	3	2	111	0	1
Goldsmith and North	58	56	58,613	0	2
Halley	8	7	4,705	0	1
Hayes (gas)	2	0	0	0	2
Hendricks	10	9	5,907	0	1
Hoover	1	1	29	0	0
Johnson	61	61	47,381	0	0
Jordan	34	32	35,774	0	2
Kermit	2	2	577	0	0
Keystone	80	80	35,914	0	0
Lehn	15	13	1,329	1	1
McCamey	32	30	7,512	0	2
McElroy	52	52	40,600	0	0
Magnolia-Sealy	2	1	97	0	1
Magnolia-Sealy, South	12	11	4,812	0	1
Noelke	34	23	55,225	6	5
North Cowden	84	82	49,563	0	2
North Ward	45	45	22,174	0	0
Pecos Valley	14	8	3,727	0	6
Penwell	1	1	1,162	0	0
Sand Hills (Permian)	45	42	84,191	2	1
Sand Hills (Ord.)	13	12	35,001	0	1
Scarborough	1	1	226	0	0
Shearer	5	4	589	0	1
Shipley (Silurian)	1	1	782	0	0
Spencer	4	4	1,803	0	0
Shipley	26	24	16,912	0	2
Taylor Link	26	19	5,577	0	7
Toborg	22	21	1,099	0	1
Todd-Deep	7	6	4,580	0	1
Waddell	14	12	49,894	0	2
Walker	43	38	4,736	0	5
West Andrews	4	4	612	0	0
White & Baker	8	7	554	0	1
World	15	14	2,465	0	1
Yates	7	7	1,355	0	0
Wildcats	63	11	5,222	2	50
Total 1941	1,063	939	790,302	13	111

PRODUCTION, 1937-1941

WEST TEXAS

						Number of wells		
Big Lake district:	1937	1938	1939	1940	1941	1-1-37	1-1-41	1-1-42
Big Lake	2,741,245	2,437,649	2,366,541	2,134,152	2,008,625	217	209	199
Grayson	58,628	44,062	38,692	30,509	19,869	5	5	4
Todd	62	.....	.....	26,335	105,136	1	5	13
World	429,622	301,708	346,116	409,294	507,262	39	50	64
Wyatt	.....	.....	.....	5,331	4,565	.....	2	1
Bean	.....	.....	.....	.....	4,392	.....	.....	1
Total	3,229,557	2,783,419	2,751,349	2,605,621	2,649,849	262	271	282
Cowden district:								
Cowden, North	2,914,430	2,387,210	3,155,156	3,568,410	5,336,337	109	414	502
Cowden, South	114,737	97,287	80,433	292,544	265,981	12	70	109
Emma	.....	.....	282,538	247,177	359,921	.....	37	55
Foster	828,562	1,809,516	2,903,137	3,462,760	4,010,968	10	509	566
Johnson	15,012	13,434	26,006	213,004	864,838	1	55	112
Total	3,872,741	4,307,447	6,447,270	7,783,895	10,837,845	132	1,085	1,344
Fuhrman district:								
Deep Rock	121,529	72,316	65,813	48,812	54,287	In Fuhrman	10	10
Fuhrman	389,189	454,150	560,544	517,293	477,033	17	55	55
Fuhrman, West	.....	.....	.....	.....	5,408	.....	.....	1
Parker	12,478	11,160	9,659	10,994	9,941	2	2	2
Total	523,196	537,626	636,016	577,099	546,669	19	67	68
Goldsmith district:								
Goldsmith	3,272,084	5,261,061	7,598,220	7,909,510	8,182,602	27	902	953
Goldsmith, North	.....	.....	.....	11,954	49,479	.....	5	10
Harper	182,558	2,846,300	1,982,627	1,235,360	1,025,613	3	184	184
West Andrews	.....	.....	.....	4,314	18,434	.....	3	6
Total	3,454,642	8,107,361	9,580,847	9,161,158	9,276,124	30	1,094	1,153
Hendrick district:								
Eaves	43,050	107,447	103,368	122,131	158,773	3	7	7
Emperor	525,890	458,834	462,541	513,293	595,079	31	98	118
Halley	209,316	166,121	137,171	97,867	117,856	11	26	23
Henderson	1,394,540	1,022,344	877,496	1,047,704	875,697	94	139	139
Hendrick	4,359,688	4,100,782	3,489,341	2,943,775	2,818,694	392	334	296
Keystone	1,067,178	975,439	1,390,047	1,667,596	1,741,165	134	240	320
Leck	174,874	127,671	106,580	165,273	200,301	10	9	9
Scarborough	670,916	574,781	605,619	540,936	619,672	110	133	135
Kermit	6,981,920	5,692,675	4,922,020	3,178,290	2,882,609	524	861	841
Total	15,427,372	13,226,094	12,094,183	10,276,865	10,009,846	1,309	1,847	1,888
Howard-Glasscock:								
Chalk-Settles	5,808,748	5,167,624	5,280,404	4,962,171	4,735,003	708	856	827
Carter	2,274	6,077	10,133	6,604	5,403	1	1	1
Total	5,811,022	5,173,701	5,290,537	4,968,775	4,740,406	709	857	828
Iatan district:								
Iatan	2,541,080	2,211,335	1,897,448	1,703,506	1,441,907	170	279	288
Snyder	50,017	372,822	788,729	497,925	355,965	17	94	97
Total	2,591,097	2,594,157	2,686,177	2,201,431	1,805,872	187	373	385
McCamey district:								
Cowden-Crane	680,173	587,701	393,219	311,921	246,404	28	116	107
Herrington	.....	11,674	17,840	11,935	10,291	.....	2	2
Hurdle	65,483	57,781	38,673	30,065	22,016	7	14	13
McCamey	4,310,510	5,167,401	4,798,757	3,990,132	3,504,196	555	874	847
Webb-Ray	8,063	8,532	10,271	8,787	5,838	2	4	2
Total	5,064,229	5,833,089	5,258,760	4,352,840	3,788,745	592	1,110	971
Pecos Valley district:								
Abell-Ordovician	.....	.....	.....	5,712	205,190	.....	1	47
Apco	.....	.....	22,600	42,180	88,307	.....	8	11
Fromme	.....	.....	9,391	27,349	34,485	.....	9	10
Lehn	.....	.....	18,105	132,183	133,023	.....	36	49
Masterson	283,664	192,621	90,622	65,529	57,779	14	24	24
Netterville	94,711	83,505	53,387	41,103	29,639	8	22	22
Payton	.....	288,285	1,108,071	676,754	471,016	.....	143	143
Pecos Valley	164,880	248,793	485,637	499,930	423,755	52	185	179
Richards	.....	.....	1,265	643	310	.....	2	2
Shearer	.....	66,872	476,879	298,735	204,396	.....	43	47
Heiner	.....	.....	.....	.....	3,822	.....	.....	1
Walker	.....	.....	.....	11,965	150,324	.....	2	39
Total	543,255	880,076	2,245,617	1,790,118	1,651,682	84	475	574
Jordan-Waddell district:								
Dune	.....	1,579	149,838	124,734	170,905	.....	10	25
Edwards	3,155	3,006	2,443	2,114	2,616	1	1	1
Jordan	70,389	625,447	1,045,702	1,278,409	1,486,486	.....	189	219
Penwell	2,038,673	1,303,111	1,312,215	1,127,244	1,465,401	144	174	175
Waddell	728,526	431,024	457,622	615,376	513,799	23	67	75
Ella Waddell	.....	.....	.....	3,192	19,818	.....	1	4
Total	2,840,743	2,364,167	2,967,820	3,151,069	3,659,025	168	442	499
Slaughter district:								
Dean	.....	16,776	22,364	18,307	12,925	.....	3	3
Slaughter	40,543	254,323	663,291	1,163,831	4,795,167	1	144	770
Total	40,543	271,099	685,655	1,182,138	4,808,092	1	147	773
North Ward district:								
Magnolia-Sealy	173,867	134,205	239,180	228,217	322,191	13	54	55
Magnolia-Sealy, South	.....	.....	.....	6,198	79,967	.....	2	15
North Ward	3,508,146	1,932,218	2,016,968	2,126,189	2,388,867	160	363	417
Total	3,682,013	2,066,423	2,256,148	2,360,604	2,791,025	173	419	487
South Ward district:								
Dobbs	4,113	2,498	2,341	2,050	8,991	2	1	1
Estes	3,088,960	2,446,108	2,379,833	2,480,989	1,943,060	62	342	352
Shipley	609,170	476,556	454,701	475,009	605,925	82	113	124
South Ward	5,620,214	3,494,885	2,334,785	1,704,659	1,317,278	513	665	603
Total	9,322,547	6,420,047	5,171,660	4,662,707	3,875,254	659	1,121	1,080
Yates district:								
Crockett	.....	7,040	87,256	96,934	77,041	.....	27	34
Noelke	.....	.....	.....	15,634	95,647	.....	3	27
Tobarg	776,417	618,945	613,695	566,288	540,233	172	231	252
White and Baker	.....	4,804	32,525	58,904	70,152	.....	14	18
Yates	10,889,221	6,808,196	7,928,427	9,956,084	5,889,958	524	568	582
Total	11,665,638	7,438,985	8,661,903	7,693,804	6,719,218	696	843	913
Wasson district:								
Waples Platter	.....	.....	9,282	14,756	17,527	.....	2	2

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PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

PANHANDLE

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Carson County	3,696,062	10,126	249,750	259,852	305,257	306,197	319,046	306,125	309,798	307,757	310,338	338,413	340,142	343,387
Gray County	12,506,265	34,265	848,490	866,051	1,028,866	1,020,996	1,057,136	1,026,326	1,049,080	1,050,559	1,066,294	1,143,322	1,147,564	1,201,581
Hutchinson County	9,805,140	26,863	646,468	667,024	786,305	797,669	824,803	810,394	827,476	834,988	845,365	909,520	919,846	933,282
Moore County	161,310	442	11,534	11,639	14,023	13,708	14,222	13,885	13,820	13,882	13,894	13,440	13,588	13,675
Wheeler County	1,589,701	4,355	124,465	123,253	139,851	135,781	140,795	133,554	132,793	133,421	127,512	137,215	132,545	129,516

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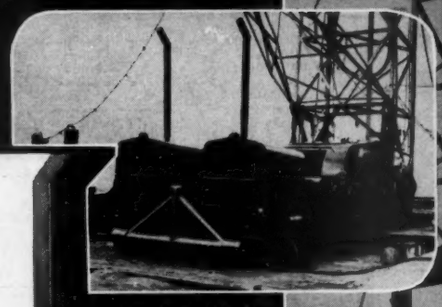
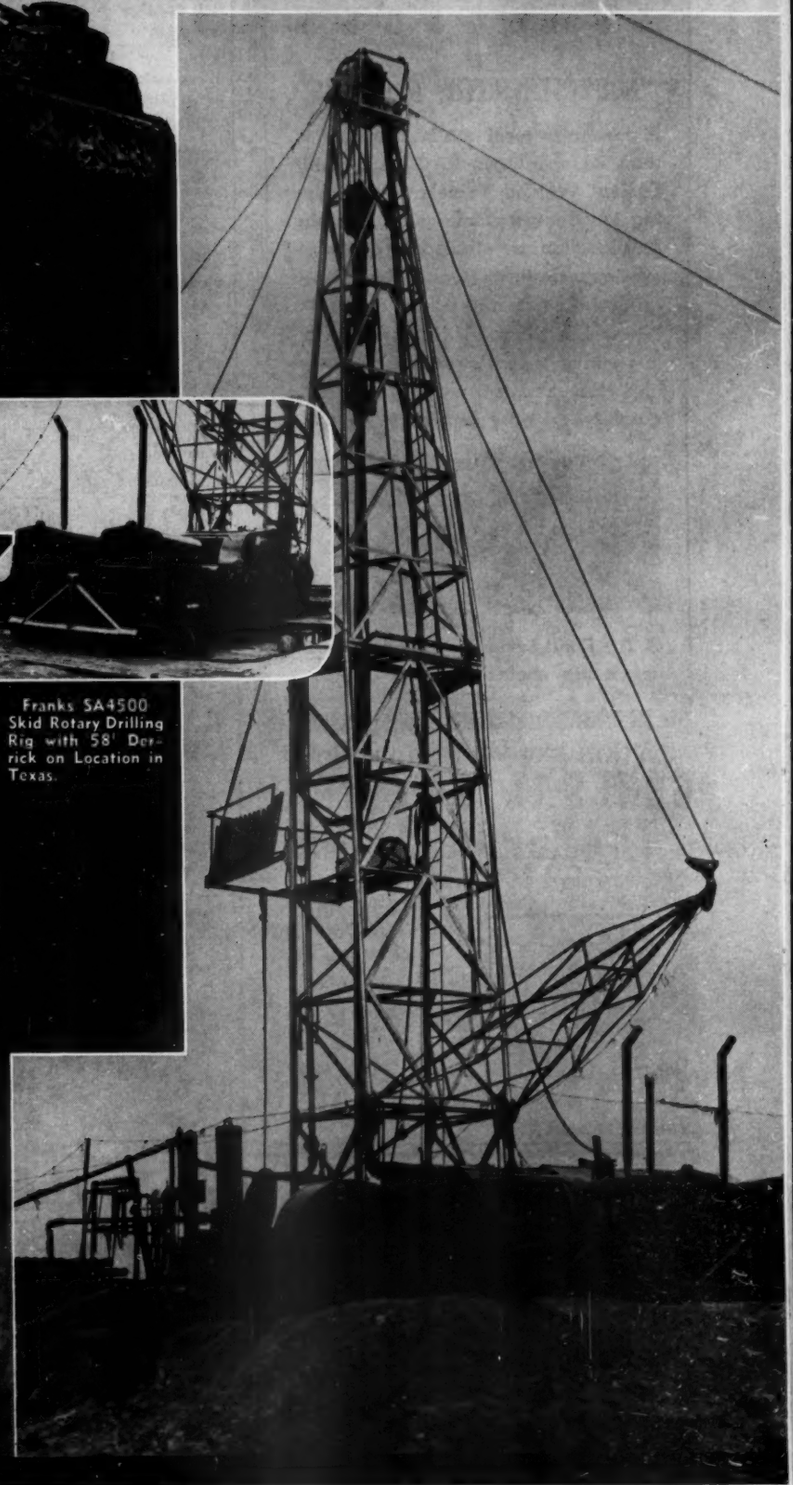


Franks SA4500 Skid Rotary Drilling Rig with 58' Derrick on Location in Texas.



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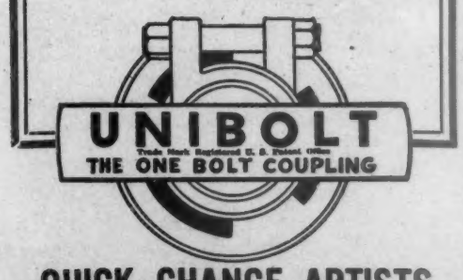

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hart in southeast Reagan County. This discovery is some 20 miles southeast of the Big Lake field. Since production is from 9,200-ft. Ellenburger as compared to 8,900 ft. in Big Lake, it is possible its discovery may result in a trend of Ordovician fields similar to those in Pecos and Crane counties.

Only two wells were completed in the Barnhart discovery at the end of the year but these producers, plus data gained from a third drilling well, indicate a structure of large extent. The second well in the field was completed 4,000 ft. to the southwest of the discovery and was about 100 ft. low on top of the Ellenburger and first oil saturation. The third test for the pool is 1½ miles east of the discovery and at about 5,275 ft. it was checking over 100 ft. high. The high cost of drilling these 9,000-ft. wells may retard development of the field, but since each 160-acre tract of the University lands is classed as a separate lease (and most of the acreage around the discovery is university land) it is expected operators will proceed to determine further the extent of productive acreage.

Another deep discovery, or possibly an extension, was the crinoidal lime (Strawn) discovery 3½ miles west of the Todd Deep field in Crockett County. This well checked unusually low on first saturation in the crinoidal but was completed for an oil producer although making large water flow.

In so far as drilling in proven fields of the south basin was concerned, operators in the Foster pool remained the most active as 111 new wells were completed. No large extensions were recorded during the year in this pool, most of the drilling being inside work. In the nearby

PRODUCTION, 1937-1941

WEST TEXAS (Continued)

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Wasson	310,811	2,859,146	5,916,061	11,038,421	13,120,011	1	1,032	1,300
West	.....	2,683	8,682	10,438	9,087	.....	1	1
Ownby	.....	.....	.....	.....	24,363	.....	.....	4
Total	301,811	2,861,829	5,934,025	11,063,615	13,169,988	1	1,035	1,307
Other fields:								
Cedar Lake	.....	.....	1,380	46,635	203,865	.....	11	31
Mason	88,560	121,124	90,596	78,863	60,839	.....	10	9
McElroy	4,551,108	3,645,457	3,702,459	5,096,031	4,819,290	414	532	579
Means	817,788	782,244	944,238	827,884	1,295,327	22	118	122
Sand Hills	508,409	441,826	530,296	785,307	1,192,510	13	94	149
Seminole	25,994	127,046	177,199	988,315	2,615,694	1	160	280
Sharon Ridge	11,976	12,901	72,098	277,418	417,679	9	95	160
Taylor Link	411,050	466,997	546,785	617,183	702,092	56	92	109
Westbrook	311,669	266,885	236,100	261,433	239,797	109	96	88
Wheat	529,734	455,206	410,418	396,174	399,719	78	91	89
Miscellaneous	31,460	50,251	45,093	51,859	95,578	21	28	37
Total West Texas	75,288,961	71,257,541	79,467,347	83,271,535	87,881,382	5,744	12,407	13,292
Daily Average	206,271	195,226	217,724	227,518	240,771			

NEW MEXICO

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Eunice-Monument:								
Arrowhead	in S. Eunice	.....	.....	915,836	1,429,380	.....	92	101
Eunice	11,043,117	8,966,399	7,882,690	6,560,819	6,657,648	365	489	491
Monument	10,968,485	9,451,048	8,206,415	6,887,042	6,959,509	263	493	497
South Eunice	574,413	1,023,355	1,327,674	938,688	969,799	in Eunice	73	75
Total	22,586,015	19,440,802	17,396,519	15,312,385	16,016,336	628	1,147	1,164
Penrose-Hardy:								
Hardy	322,436	655,503	1,095,429	1,098,863	782,967	9	120	120
Penrose	802,267	1,619,380	1,695,407	1,602,756	1,212,375	16	186	190
Skaggs	.....	.....	31,247	24,453	23,945	.....	3	3
Skelly	409,036	568,365	560,696	593,895	541,378	.....	72	81
Total	1,523,739	1,843,248	3,382,779	3,319,967	2,560,665	25	381	394
Cooper-Lynn:								
Cooper	2,243,988	1,713,780	1,409,398	1,151,150	1,036,533	83	87	87
Eaves	384,426	337,539	297,065	252,931	290,827	11	19	23
Jal	443,718	377,168	225,235	163,793	128,294	39	20	18
Lynn	95,028	287,670	280,623	299,566	347,642	8	27	29
Rhodes	31,304	40,878	35,225	56,791	144,221	1	10	15
Total	3,198,464	2,757,035	2,247,536	1,924,231	1,947,517	142	163	172
Langlie-Mattix:								
Langlie	593,349	1,261,063	1,782,190	1,587,538	1,363,624	2	124	125
Mattix	520,122	967,930	1,510,907	1,687,141	1,400,856	12	150	156
Total	1,113,471	2,228,993	3,292,097	3,274,679	2,764,856	20	274	281
Grayburg-Loco Hills:								
Grayburg-Jackson	.....	.....	1,508,691	1,772,757	1,627,250	.....	216	176
Leonard	.....	.....	141,133	298,273	304,450	.....	45	46
Loco Hills	.....	.....	377,115	1,959,251	2,307,900	.....	142	181
Total	in Artesia	in Artesia	2,026,939	4,030,281	4,239,640	.....	403	403
Artesia-Red Lakes:								
Artesia	1,986,076	2,187,570	144,485	158,055	155,312	*241	157	180
Red Lakes	.....	.....	87,115	100,580	141,721	.....	21	63
Total	1,986,076	2,187,570	231,600	258,635	296,033	241	178	243
Shugart:								
Leo	.....	.....	.....	.....	15,323	.....	.....	6
Shugart	.....	.....	76,914	169,801	213,241	.....	23	29
Total	.....	.....	76,914	169,801	228,564	.....	23	35
Corbin	.....	.....	.....	8,310	16,004	.....	2	2
Halfway	.....	.....	.....	67,627	112,314	.....	6	9
Hobbs	7,310,713	5,039,849	4,400,629	3,784,875	3,686,430	252	248	257
Lynch and N.	318,622	221,699	194,180	164,158	159,695	13	12	13
Robinson-N. Maljamar	.....	.....	94,150	90,461	56,758	.....	14	14
South Lovington	.....	.....	191,531	477,505	523,788	.....	34	40
Salt Lake	.....	.....	.....	.....	18,627	.....	.....	5
Vacuum	7,051	885,877	3,028,381	4,737,657	4,800,370	.....	328	341
West Eunice	.....	.....	32,427	90,216	165,758	.....	9	15
Dayton	.....	.....	.....	4,727	29,922	.....	7	10
High Lonesome	.....	.....	.....	8,480	12,334	.....	6	7
Maljamar and S.	in Artesia	in Artesia	329,739	760,003	1,650,825	.....	86	147
Caprock	.....	.....	.....	.....	238	.....	.....	2
Getty-Barber	23,057	58,817	31,513	21,688	166,904	6	8	11
Total S.E. N. Mex.	38,054,251	35,663,890	37,365,685	38,502,749	38,453,578	1,327	3,332	3,563
Aztec	1,134	2,286	708	1,185	130	12	16	16
Hogback	70,037	69,558	68,746	73,421	72,799	7	10	11
Rattlesnake	283,061	245,425	204,042	143,291	97,406	28	36	36
Table Mesa	29,589	27,368	29,054	36,145	35,910	6	7	7
Total	383,821	344,637	302,550	254,048	206,245	55	69	70
Total New Mexico	38,438,072	36,008,527	37,668,235	38,756,797	38,659,823	1,382	3,401	3,633
Daily average	105,310	98,653	103,201	105,892	105,917	.....	.....	.....

*Artesia-Jackson-Maljamar.

Johnson field some 61 producers were added, while in North Cowden and Keystone over 80 new wells were drilled in each. In the Abell field, operators developed it into the largest Ordovician producing field in West Texas by adding 39 producers during the year.

While the north basin received only five new pools during the year, most of these were of importance because of their relationship to proven areas. In the latter part of the year the area's potential productive limits were extended some 40 miles to the north and east by the completion of a commercial producer 5 miles east of Lubbock. This discovery was completed in the Clear Fork lime, stratigraphically lower than the San Andreas from which production is derived in Wasson, Slaughter and Cedar Lake. The discovery, therefore, not only extended productive limits but also opened to oil production a horizon that has not been too widely exploited in West Texas.

Several miles northeast of the abandoned two-well Scanlan field, and just across the county line from Cedar Lake field of Gaines County, a San Andres discovery was completed late in December. No additional drilling has been done to evaluate the worth of this discovery, as is likewise the case in the Lubbock well.

Another discovery of importance was the opening of 7,200-ft. oil production in the Wasson pool to establish a depth record for the north basin. This pay is 2,000 ft. below the field's regular pay, but additional drilling will be required to establish the extent of production from this horizon.

During the year 1,182 new oil producers were completed in this northern area, over 600 of which were in the Slaughter field and of the remainder over 300 were in the Wasson and Seminole fields. The latter two fields are now nearly drilled up, but the Slaughter field still has several hundred undrilled locations. Operators in Slaughter have worked out spacing patterns to conform to emergency requirements so that drilling is expected to remain at high levels for much of this year. It is expected wildcatting will be accelerated and new discoveries will receive more attention than they would have a year ago.

NORTHERN WEST TEXAS DISTRICT

Summary of Wells Completed During 1941

Field—	Comp.	Oil	Prod.	Gas	Dry
Chalk	5	5	3,078	0	0
Cedar Lake	22	20	13,441	0	2
Deep Rock	1	1	1,212	0	0
Emma	21	20	21,756	0	1
Iatan-East Howard	10	9	2,103	0	1
Means	4	4	1,143	0	0
Owenby	4	4	2,707	0	0
Seminole	120	120	70,747	0	0
Sharon Ridge	77	70	12,965	0	7
Slaughter	637	634	666,328	0	3
Snyder	6	6	901	0	0
Wasson	285	284	196,485	0	1
West Fuhrman	1	1	110	0	0
Wasson Deep	2	2	1,310	0	0
Wildcats	39	2	180	0	37
Total 1941	1,234	1,182	994,466	0	52

TEXAS PANHANDLE

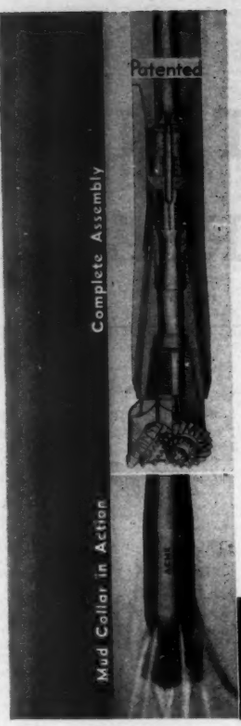
Summary of Wells Completed During 1941

County—	Comp.	Oil	Prod.	Gas	Dry
Bailey	1	0	0	0	1
Carson	44	38	6,040	5	1
Gray	279	266	50,368	2	11
Hemphill	1	0	0	0	1
Hutchinson	313	309	70,191	3	1
Potter	2	0	0	1	1
Moore	32	0	0	32	0
Sherman	1	0	0	1	0
Wheeler	45	35	3,760	5	5
Total 1941	718	648	130,359	49	21

SOUTHEAST NEW MEXICO

Completions by Months

	Comp.	Oil	Gas	Dry	Footage
January	28	20	1	7	82,301
February	15	12	1	2	47,547
March	19	13	2	4	58,999
April	23	22	0	1	74,573
May	26	24	1	1	80,187
June	15	12	0	3	52,698
July	41	31	1	9	127,927
August	20	10	1	9	66,674
September	13	11	1	1	43,685
October	20	18	0	2	45,543
November	23	18	0	5	73,498
December	15	12	0	3	31,422
Total	258	203	8	47	785,054



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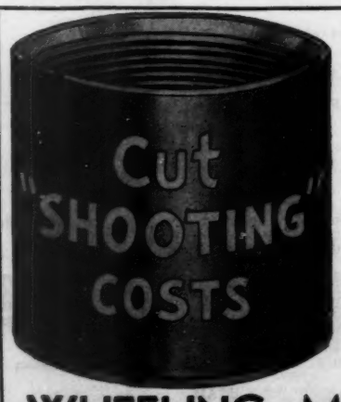

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GAS DEVELOPMENT IN ALL AREAS SHOWS LARGE INCREASE

By T. R. INGRAM

COLORADO had two discoveries, one oil and the other gas, in deeper horizons in producing fields in 1941, and two fields chalked up extensions of the proven areas. The most important of the discoveries was at Wilson Creek, Rio Blanco County, in March, when California Co. 5 Unit, NW NE NE 34-3n-94w, was completed in the Sundance at 6,570 ft. While other wells drilled on the structure had shown oil in the upper part of the Sundance, this was the first commercial producer in that pay.

The gas discovery in a deeper pay was made in November in Mountain Fuel Supply Co. 2 Lasher, NE NE NE 25-12n-101w, on the West Hiawatha structure, Moffat County, in a sand in the Wasatch formation. This field adjoins East Hiawatha which produces both oil and gas. Only five wells had been drilled on West Hiawatha in the past 10 years, all being completed in sands around 2,200 ft. This well was drilled to explore sands which produce oil on the east structure. It was drilled to 3,416 ft. and the 7-in. was cemented at 3,300 ft. and perforated opposite sands at 2,905-17 ft. and 3,231-56 ft. and produced 993,000 cu. ft. with a rock pressure of 850 lb.

The Powder Wash oil and gas field in Moffat County was extended 1 mile to the southeast of 1 Musser in February for gas in the Wasatch formation, in Mountain Fuel Supply 2-A Musser, CWL NW SE 4-11n-97w. It was drilled to 2,504 ft. with the 7-in. set at 2,494 ft. and perforated

PRODUCTION, 1937-1941

WYOMING

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Lance Creek	4,290,301	4,655,349	6,697,419	9,200,356	8,918,731	29	133	159
Salt Creek	5,952,821	5,659,874	5,352,584	5,314,209	5,075,668	1,361	1,880	1,870
Badger Basin	66,216	47,689	51,755	95,478	58,190	2	3	3
Big Muddy	478,368	439,496	433,746	434,880	421,863	149	149	149
Black Mountain	45,806	45,706	.....	57,840	32,730	6	.....	6
Byron	405,511	537,212	635,930	824,806	948,619	12	14	15
Cody Dome	.....	8,712	17,359	22,270	14,900	.....	1	1
Cole Creek	.....	17,634	23,123	152,350	286,806	.....	8	13
Dallas Derby	202,465	162,885	167,607	169,116	144,243	42	42	42
Dewey Dome	.....	13,064	3,888	2,130	.....	.....	.....	.....
Dutton Creek	18,292	19,079	15,006	18,421	20,448	3	1	1
East Mahoney	.....	.....	.....	12,810	62,175	.....	1	2
Elk Basin	126,361	100,437	205,292	237,918	217,496	143	144	144
Frannie	487,571	536,156	549,022	955,993	1,117,517	12	14	21
Garland	846,074	786,140	854,948	1,106,672	614,941	12	14	14
Grass Creek	673,091	501,384	777,050	711,642	1,163,993	330	330	330
Hamilton Dome	399,721	275,769	208,775	222,017	255,078	31	33	33
Hidden Dome	134,153	41,811	25,908	26,154	30,361	11	15	15
Iron Creek	.....	5,772	5,323	3,313	4,672	.....	1	1
La Barge	365,993	338,980	333,348	531,109	699,792	91	106	122
Lander	112,809	93,724	86,243	86,513	99,312	13	11	11
Lost Soldier	457,396	607,544	671,541	853,547	2,313,918	60	76	83
Mahoney	.....	13,492	107,814	157,538	464,218	.....	4	8
Maverick Springs	.....	.....	.....	4,329	495,555	.....	2	20
Medicine Bow	1,404,775	1,143,030	615,960	274,746	248,092	5	10	10
Mule Creek	24,798	32,873	63,190	78,118	145,112	38	42	42
Oregon Basin	1,444,989	1,002,199	1,013,260	2,036,138	2,681,716	33	38	49
Osage	283,425	298,761	261,997	219,620	212,800	352	280	291
Quealy	262,019	269,722	220,952	178,071	161,480	5	17	17
Pilot Butte	.....	.....	.....	.....	1,240	.....	5	5
Rex Lake	.....	1,500	834	.....	22,370	.....	3	3
Rock River	729,383	624,729	991,773	921,894	944,093	52	42	46
South Casper Creek	92,019	98,501	.....	30,698	161,201	17	19	21
Spindletop	.....	10,340	2,440	2,548	.....	.....	.....	.....
Teapot Dome	7,108	7,043	6,791	5,576	5,035	2	2	2
Warm Springs	.....	41,007	41,659	26,215	25,481	37	19	19
Wertz	57,664	404,865	796,808	1,113,300	1,862,215	1	4	13
Poison Spider	110,748	99,262	35,901	43,491	88,714	13	14	14
Midway	10,441	11,532	6,050	.....	.....	1	.....	.....
Waugh	75,696	5,176	.....	.....	.....	1	.....	.....
Total	19,637,218	18,956,277	21,279,956	26,132,076	30,180,776	2,189	3,477	3,595
Daily average	53,801	51,935	58,279	71,399	82,687			

DISCOVERIES IN ROCKY MOUNTAIN AREA DURING 1941

Field, county, owner, well number—	Location—	Comp. date	Initial prod. (bbl.)	Total depth (ft.)	Producing formation	Prod. section (ft.)	Total wells 1941	Remarks—
COLORADO								
Powder Wash, Moffat, Mountain Fuel Supply Co. 2-A Musser	4-11n-97w	2/3	Gas	2,504	Upper Wasatch	2,161-78 2,500-04	3	Extension, 18,000,000 cu. ft.
West Hiawatha, Moffat, Mountain Fuel Supply Co. 2 Lasher	25-12n-101w	10/15	Gas	3,416	Lower Wasatch	2,905-17 3,236-61	1	Discovery deeper horizon, 993,000 cu. ft.
Wilson Creek, Rio Blanco, Texas-California 5 Unit	34- 3n-94w	3/25	400	6,570	Sundance, Morrison	6,543-70	3	Discovery in Sundance extension in Morrison
WYOMING								
Canyon Creek, Sweetwater, West States Pet. Corp. 1 Unit	10-12n-101w	8/28	Gas	3,900	Wasatch	2,688-2,710	1	1,500,000 cu. ft.
Circle Ridge, Fremont, Continental Oil Co. 3 Shoshone	1- 6n- 3w	11/10	191	660	Tensleep	395- 660	1	Extension, 216 bbl. in Ember cased off.
Cole Creek, Natrona, General Petroleum 31-27-P	27-35n-77w	6/20	150	4,594	Shannon	4,562-94	6	Extension, most southerly and typical of 6 outposts drilled on 4 sides of producing area.
East Allen Lake, Carbon, Medicine Bow Oil Co. 1 Richards	18-22n-78w	6/1	Gas	2,400	Sundance	2,180-2,350	1	Extension, 15,000,000 cu. ft.
East Mahoney, Carbon, Sinclair-Wyo. 5-E	29-26n-87w	7/15	135	4,327	Tensleep	4,302-27	1	Extension.
Lost Soldier, Sweetwater, Sinclair-Wyo. 102	3-26n-90w	11/10	210	4,230	Tensleep	3,968-4,230	5	Extension, most northerly of 5 wells in Tensleep drilled in 1941.
Mahoney, Carbon, Sinclair-Wyo. 5-C Mahoney	34-26n-88w	8/14	185	4,566	Tensleep	4,325-4,410	3	Extension, all 3 wells and 1 and deepened offsets to producers on 4 sides.
Maverick Spgs. Fremont, Kirk Oil Co. 6 Tribal	23- 6n- 2w	11/25	60	1,632	Embar	1,527-1,632	6	Extension typical of 6 wells in 1941 aggregate 2,645 bbl.
South Elk Basin, Park, MacKinnie Oil & Drilling Co. 1 Northern Pacific	5-57n-99w	12/1	Gas	3,157	Dakota	3,142-57	1	3,000,000 cu. ft. 700 lb. R.P.
Wertz, Carbon, Sweetwater, Sinclair-Wyoming 21-A Wertz	6-26n-89w	9/15	960	6,129	Tensleep	5,794-6,129	10	Extension, most northerly of 10 outpost wells drilled in 1941.
MONTANA								
Cut Bank, Glacier Santa Rita 15 Tribal	3-35n- 6w	12/10	468	2,976	Sunburst	2,948-76 1,800-50	7	Extension, farthest west of 7 wells drilled in area in 1941 to Sunburst and Cut Bank sands.
Grassy Butte, Liberty Montana-Dakota, Utilities 1 Oswood	18-35n- 4e	9/25	Gas	2,925	Sand in Colorado	2,190-2,240	1	1,000,000 cu. ft., 450 lb. R.P.
Midway, Toole, Big West Oil, 1 Dahlquist	6-34n- 4w	12/7	Gas	2,256	Cut Bank	2,208-55	1	6,600,000 cu. ft., 750 lb. R.P.
Reagan, Glacier, Ed Reagan 1 Tribal	22-37n- 7w	6/30	Gas	3,869	Madison	3,835-69	1	6,000,000 cu. ft., 1,200 lb. R.P., sprayed oil.
West Kevin, Toole, High Gravity Oil 1 Gov.	19-35n- 3w	3/10	6	2,200	Ellis-Madison	2,160-70	3	
West Kevin, Toole, High Gravity Oil 2 Gov.	18-35n- 3w	5/15	120	2,452	Ellis-Madison	2,448-52		
West Kevin, Toole, High Gravity Oil 3 Gov.	18-35n- 3w	12/10	270	2,495	Ellis-Madison	2,486-95		
NORTHWEST NEW MEXICO								
Fulcher Basin, San Juan, Carroll & Cornell 5 Cornell-Gov.	13-29n-12w	9/5	40	980	Farmington	940- 980	1	Oil discovery in gas field.
UTAH								
Clay Basin, Daggett, Mountain Fuel Supply 1 Sparks	23- 3n-24e	7/5	Gas	5,980	Dakota	5,896-5,980	1	Extension.

opposite gas sand at 2,161-78 ft. and was put on production from that horizon and from sand at 2,500-04 ft. It gaged 18,000,000 cu. ft. initial with a rock presure of 778 lb.

COLORADO

Summary of Wells Completed During 1941

Field or district—	Comp.	Oil	Prod.	Gas	Dry
Alamo	1	0	0	0	1
Boulder	1	0	0	0	1
East Hiawatha	3	2	526	1	0
Florence	1	1	40	0	0
Iles	2	1	1,580	0	0
La Veta	1	0	0	0	1
Moffat	1	1	173	0	0
Oak View	2	2	7	0	0
Ojo	1	1	10	0	0
Powder Wash	3	0	0	2	1
Ridgway	1	0	0	0	1
Rangely	7	6	223	0	1
South Park	1	0	0	0	1
Sterling	1	0	0	0	1
Thurman	1	0	0	0	1
Trull Creek	1	0	0	0	1
Watkins	1	0	0	0	1
West Hiawatha	1	0	0	1	0
Wilson Creek	3	3	1,316	0	0
Total 1941	33	17	3,875	4	12

WYOMING

Wyoming chalked up only two discoveries, both gas, in 1941. The productive areas of seven oil fields and one gas field were extended.

The first gas discovery of the year was made in West States Petroleum Corp. 1 Unit (1 Humphreys-Government), NW SE SE 10-12n-101w, on the Canyon Creek structure in Sweetwater County, which lies to the northwest of the main axis of the folding in the Vermillion Creek basin on which is located the West Hiawatha and East Hiawatha fields. It was completed at 2,790 ft. in a sand in the Wasatch formation at 2,688-2,710 ft. for 1,500,000 cu. ft. after plugging back from 3,900 ft. It had a showing of oil in 20 ft. of sand at 3,250 ft. The test was on a unitized block of 10,000 acres.

The other discovery was made in December in South Elk Basin, Park County, in the MacKinnie Oil & Drilling Co. 1 Northern Pacific, CNL NW NW 5-57-99w, in the Dakota sand at 3,142-57 ft. The well has not yet been completed, but in a drill-stem test, with the valve open 30 minutes, it showed for 3,000,000 cu. ft., with a bottom-hole pressure of 700 lb. The well is located in the most southeasterly of several fault blocks intervening between it and Elk Basin field proper, the center of which is approximately 3 miles to the northwest. Elk Basin is one of the older fields which produces light oil from the Frontier sands.

WYOMING

Summary of Wells Completed During 1941

Field or district—	Comp.	Oil	Prod.	Gas	Dry
Big Piney	1	0	0	0	1
Big Pole Cat	1	0	0	0	1
Bison Basin	1	0	0	0	1
Bunker Hill	1	0	0	1	0
Byron	1	1	430	0	0
Canyon Creek	1	0	0	1	0
Circle Ridge	2	1	191	0	1
Cole Creek	6	5	510	0	1
Dakota High	1	0	0	0	1
Dewey	1	0	0	0	1
East Allen Lake	1	0	0	1	0
East Hiawatha	1	0	0	0	1
East Mahoney	1	1	135	0	0
Elk Mountain	1	0	0	0	1
Frannie	7	7	1,914	0	0
Hamilton	1	0	0	1	0
Hidden Dome	1	0	0	0	1
Horne Valley	1	0	0	0	1
Horse Creek	2	0	0	0	2
Kirby Creek	2	1	3	0	1
La Barge	18	16	1,445	0	2
Lance Creek	27	26	15,818	0	1
Lost Soldier	7	7	5,486	0	0
Mahogany Butte	1	0	0	0	1
Mahoney	4	4	1,572	0	0
Maverick Springs	6	6	2,545	0	0
Muskrat	1	0	0	1	0
Newcastle	1	1	2	0	0
Oregon Basin	11	11	3,375	0	0
Osage	20	13	250	0	7
Plunket	2	2	25	0	0
Rock River	4	4	583	0	0
Rocky Point	1	0	0	0	1
Salt Creek	6	5	749	0	1
South Casper Creek	2	2	253	0	0
Six Mile	1	0	0	0	1
Torchlight	1	0	0	0	1
Wertz	9	9	13,263	0	0
Miscellaneous	5	0	0	0	5
Total 1941	161	123	48,549	5	34

PRODUCTION, 1937-1941

MONTANA

Border	48,975	22,666	50,531	30,891	21,062	23	17	17
Cat Creek	221,381	209,144	191,160	181,792	167,632	192	104	104
Cut Bank	3,346,205	2,770,760	3,484,515	4,003,231	4,996,880	334	521	632
Dry Creek, etc.	114,407	338,569	312,935	246,381	165,638	25	31	32
Kevin-Sunburst	1,649,625	1,271,066	1,535,450	1,817,894	1,699,083	1,120	1,009	1,057
Pondera	418,768	212,712	279,525	300,556	292,739	157	153	153
Total	5,799,364	4,824,917	5,854,116	6,580,745	7,343,034	1,851	1,835	1,995
Daily average	15,889	13,219	16,039	17,980	20,118			

COLORADO

Florence	57,445	62,843	60,245	56,721	54,799	105	105	106
Fort Collins	15,675	31,757	39,403	58,107	45,235	11	6	6
Greasewood	6,674	11,429	6,241	8,773	1,781	3	1	.....
Iles	1,036,108	693,822	733,775	579,260	549,971	32	30	31
Hiawatha	.....	.....	.....	79,933	192,430	10	3	5
Moffat	143,474	125,000	103,001	113,665	114,607	12	12	13
Powder Wash	.....	.....	.....	.....	41,158	.....	.....	3
Price (Gramps)	159,737	174,896	182,506	123,051	95,155	11	9	9
Rangeley	29,541	30,075	19,396	33,779	60,073	4	8	14
Tow Creek	57,228	56,900	52,196	49,240	49,533	15	9	9
Wellington	72,509	77,503	74,473	69,173	71,532	22	11	11
Wilson Creek	.....	60,149	129,963	229,875	456,537	.....	2	5
Total	1,578,391	1,324,374	1,401,199	1,401,577	1,732,503	225	196	212
Daily average	4,324	3,628	3,839	3,829	4,747			

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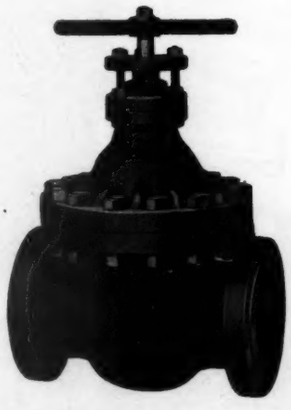

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PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

WYOMING

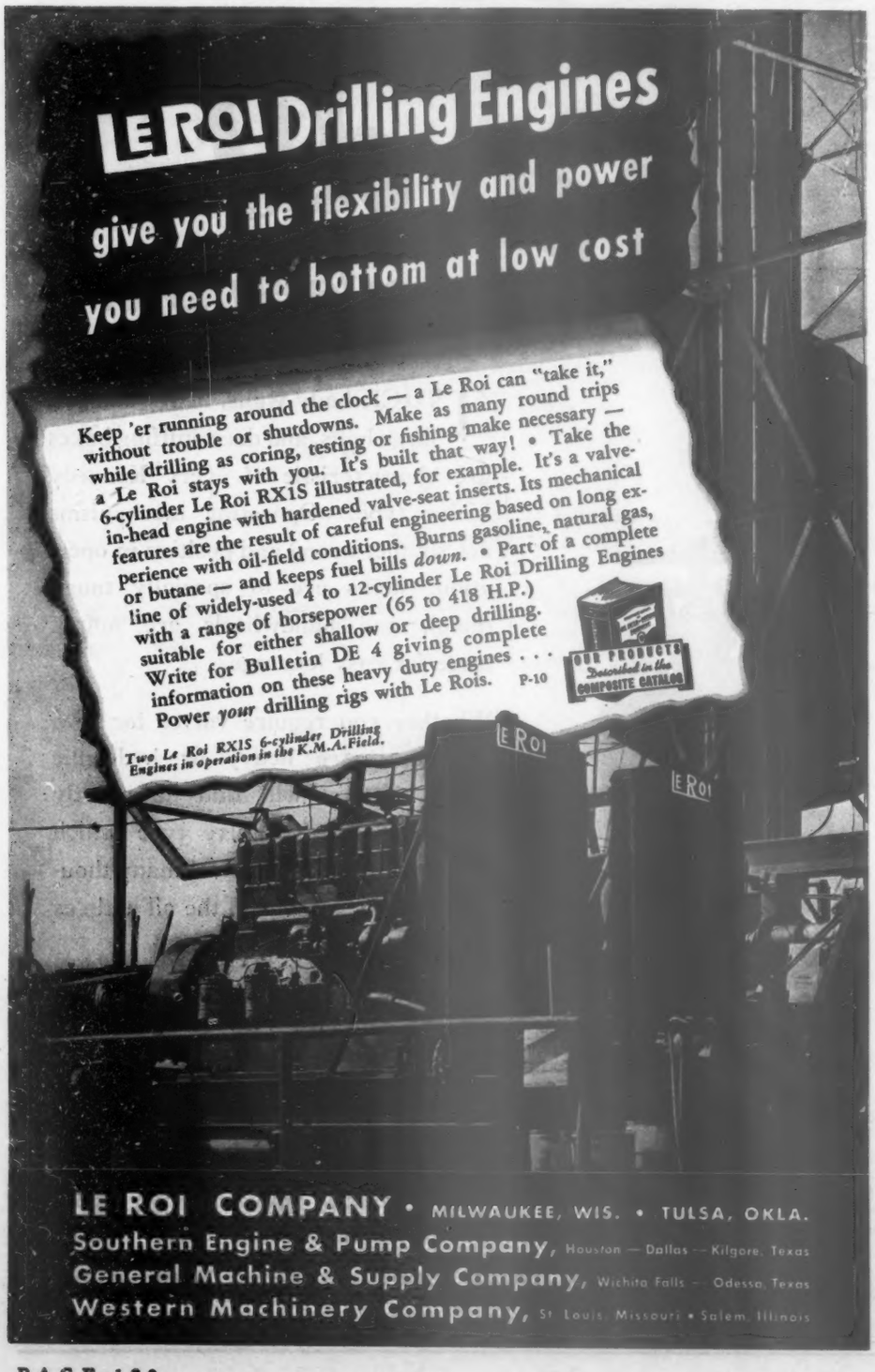
Fields—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Lance Creek	8,918,731	24,435	807,477	736,847	806,681	821,938	841,937	790,666	723,585	704,803	676,024	690,030	651,617	667,126
Salt Creek	5,075,668	13,906	437,599	391,543	417,194	422,120	430,025	424,181	448,643	423,741	410,278	461,478	388,581	428,285
Oregon Basin	2,681,716	7,347	198,219	167,323	204,816	179,548	194,808	189,891	245,361	259,248	262,330	254,144	262,211	263,817
Lost Soldier	2,313,918	6,340	151,947	142,083	161,552	152,848	207,563	182,307	231,808	220,339	175,006	229,530	225,763	233,172
Wertz	1,862,215	5,102	198,781	108,302	102,784	164,624	169,348	147,777	147,422	155,045	144,529	163,999	171,969	187,635
Grass Creek	1,163,993	3,189	33,565	53,557	58,290	76,659	147,893	120,735	148,050	138,119	190,038	109,214	34,453	53,420
Frannie	1,117,496	3,062	94,842	89,446	96,108	85,927	86,533	91,272	93,706	84,429	105,865	96,663	90,183	102,543
Byron	1,108,619	3,037	118,921	59,924	66,315	79,294	99,617	62,828	119,968	89,397	88,754	134,029	68,072	61,500
Rock River	944,093	2,587	77,779	69,415	77,724	77,749	79,975	83,756	81,961	81,639	76,989	80,381	79,223	77,682
LaBarge	699,793	1,917	58,638	53,258	56,350	53,383	53,361	55,028	61,584	61,232	62,843	67,603	54,430	62,085
Garland	614,941	1,685	64,156	56,973	53,913	53,216	55,573	54,207	55,786	49,431	46,485	47,821	41,840	35,540
Maverick Springs	495,555	1,358	22,009	23,913	10,753	10,039	24,815	11,313	34,208	35,360	67,723	90,616	81,444	83,362
Mahoney Dome	464,218	1,272	44,774	40,752	47,606	50,520	47,721	39,328	35,347	33,513	31,671	33,823	32,157	27,006
Big Muddy	421,863	1,156	36,646	33,352	36,424	34,695	35,490	34,423	36,066	35,483	34,749	35,451	34,357	34,737

MONTANA

Fields—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Cut Bank	4,996,880	13,690	378,212	357,841	408,682	397,888	411,360	405,231	426,788	411,010	436,365	470,524	439,146	453,833
Kevin-Sunburst	1,699,083	4,755	147,431	130,712	123,606	117,704	135,062	154,587	152,848	154,274	153,588	151,235	137,284	140,747

COLORADO

Fields—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Iles Dome	549,971	1,507	45,829	43,195	46,288	45,497	46,218	45,357	47,300	47,178	46,553	44,643	44,623	49,290
Wilson Creek	456,539	1,250	27,047	25,619	29,791	34,275	33,643	32,881	35,680	38,128	40,605	52,902	50,597	55,371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Six gas wells have been drilled in the Dakota on top of the structure. The present bottom-hole pressure of these gas wells is 405 lb., which, compared with the pressure of the new well, is accepted as indicating a separate closure and not an extension. It is located in a block of 1,500 acres.

The Wertz field in Carbon County added approximately 200 acres to the area proven by development in the Tensleep sand of Pennsylvanian age in 10 wells, including one completed at the close of the year and not included in the tabulated summary. Initial production, through the tubing, aggregated 13,553 bbl. Drilling in the field was progressive from the inside out, the spacing in some instances being one well to 10 acres. The development carried the proven area over into Sweetwater County to within 1½ miles of the Lost Soldier field, which also is producing from the Tensleep. The best of these completions was 18-A Wertz, SE SE NW 7-26n-89w, which made 4,800 bbl. initial through 2½-in. tubing from the Tensleep at 5,719-6,071 ft.

Outside of the Bairoil district the most important extensions of producing fields took place at Cole Creek where the General Petroleum Corp. drilled seven wells which added approximately 280 acres to the developed area of the field. Five of these had an aggregate initial production of 501 bbl. on the pump from the Shannon sand, one had not been tested at the end of the year, and one was plugged and abandoned. The failure was No. 37-21-G, NW SE SW 21-35n-77w, which marked the limits of the Shannon sand pool on the southwest flank. The extensions, one well to 40 acres, were on the four sides of the field and added 280 acres to the area of the field.

MONTANA

Montana had four discoveries in 1941, of which one opened a pool of high gravity light oil, one was a gas discovery giving indications of turning to oil, and the other two were gas. The only important extensions of producing pools took place on the west and south sides of the Cut Bank field.

The oil discovery was made on the west side of the Kevin-Sunburst field in Toole County and is located on the plateau formed by the rimrock which runs north and south through the area. The Rimrock pool lies directly to the east. The discovery was made in March in High Gravity Oil 1 Government, SE NW NE 19-35n-3w, which was drilled to 2,200 ft., and was completed for 5 to 6 bbl. daily after plugging back to 2,170 ft. and acidizing with 1,000 gal. It had the contact at 2,160-70 ft. with little more than a show, but was made into a small producer after harsh treatment, including two jobs each of shooting and acidizing.

The rig then was moved nearly ¾ mile northwest for 2 Government, CSL NE SW 18-35n-3w, and located on the very top of the rimrock. It

was drilled to 2,452 ft., having the contact at 2,448-52 ft., and was completed in May for 120 bbl. initial on the pump after acidizing with 500 gal. It had a show of oil in the Sunburst at 2,172-2,202 ft., which was cased off with the 7-in. at 2,230 ft. An east offset averaged 250 bbl. daily, 37.3-gravity oil on a 10-day test. The wells are located 1½ miles northwest of the nearest producers and open a large area for development.

The gas discovery which gives favorable oil indications was located 6 miles north and 6 miles west of the nearest production in the Cut Bank field on the Twin Rivers or Reagan structure and was made in Ed Reagan 1 Tribal-194, CEL SE NE 22-37n-7w. It reached the top of the Madison lime at 3,824 ft. in April and showed sulfur gas at 3,824-43 ft. A core then was taken showing 8 to 10 ft. of oil-saturated lime. The 7-in. was set at 3,835 ft. A spudder then was moved on and the lime was acidized four times with a total of 5,000 gal. On a test it showed for 6,000,000 cu. ft. of gas with a rock pressure of 1,200 lb., with sprays of oil. It was then shut in with the intentions of drilling deeper the coming spring.

A gas discovery was made on the Grassy Butte structure, in Liberty County, 25 miles east of the Kevin-Sunburst field in Montana-Dakota Utilities 1 Oswood, C NE SW 18-35n-4e, on a block of 10,000 acres. In a sand at 1,939-47 ft. it showed for 2,000,000 cu. ft. with a rock pressure of 347 lb., and at 2,164-2,244 ft. it had another sand which made 4,000,000 cu. ft. on a drill-stem test. The top of the Kootenai was at 2,244 ft. The Sunburst was at 2,690-2,700 ft. and base of Ellis at 2,870-95 ft.

The other gas discovery was made in the Midway district between the Kevin-Sunburst and Cut Bank fields in the Big West Oil Co. 1 Dahlquist, C NW 6-34n-4w, in the center of a block of 2,000 acres. It is located 11 miles west of the town of Kevin and 1¾ miles northeast of the nearest producer in the Cut Bank field. It was completed in December at 2,256 ft., total depth, for 6,600,000 cu. ft. of gas with a rock pressure of 750 lb. The Sunburst sand at 2,166-75 ft. was dry and the Cut Bank sand was found at 2,208-55 ft. Elevation is 3,460 ft. A pipe line is to be constructed to the company's refinery at Shelby and a second well ½ mile to the southeast is under way.

The most important extension of the Cut Bank field occurred on the west side in 35n-6w, 22 miles to the north of the most southerly producer in the field. In this area seven wells were drilled, all to the west of production developed up to the beginning of 1941, with an aggregate initial of 1,665 bbl., or an average of 235 bbl., which is above the field average. Of these, two were producers in the Sunburst, four in the Cut Bank sand, and one in the two sands combined.

The most intensive drilling in the field was in the extreme south end which was made necessary by a sale of Blackfeet Indian leases earlier in the year, with drilling obligations, and the drilling of offsets. These leases were along the east side of 32n-6w and 32n-5w, and in and around this area 56 oil wells, or half of all wells in the field were drilled. They accounted for 11,673 bbl. of new production. While this was a new development, they were considered in proven territory because of a well in the NE 36-32n-6w, which was drilled several years ago. The average for these wells was high, being 208 bbl. The best was R. C. Jeffries 1 Tribal-201, NE SE NE 30-32n-5w, which made 1,000 bbl. first 24 hours.

NORTHWEST NEW MEXICO

One oil discovery was made in the Fulcher Basin district, San Juan County, Northeast New Mexico, in October in Carroll & Cornell 5 Cornell-Government, CEL NE NE 13-29n-12w. This field was discovered for gas in 1940 in the Picture Cliff sand at around 1,900 ft. The Carroll & Cornell well was drilling for that sand when it encountered oil in a sand in the Farmington formation at 940-80 ft. This horizon generally is a thin sand, but at this location it is much thicker and was saturated for 40 ft. While no adequate test has been made on account of mechanical difficulties, it pumped 52 bbl. in 6½ hours before casing was run. Afterwards it averaged 40 bbl. a day, but this is not considered conclusive as to its possibilities.

UTAH

The Clay Basin gas field in Daggett County, northeastern Utah, was extended ¾ mile to the southeast in the Mountain Fuel Supply Co. 1 Sparks, SW SW SE 23-3n-24e. It was completed in July in the Dakota at 5,896-5,980 ft. for 19,234,000 cu. ft. The developed area now extends approximately 4 miles east and west with a width of 1½ miles. The gas furnishes a part of the company's supply for its trunk line from the Baxter Basin-Hiawatha-Powder Wash-Clay Basin district into Central Utah.

MONTANA

Summary of Wells Completed During 1941

Field or district—	Comp.	Oil	Prod.	Gas	Dry
Basin Creek	1	0	0	0	1
Bowdoin	30	0	0	29	1
Bow and Arrow	1	0	0	0	1
Bowes	7	0	0	5	2
Box Elder	4	0	0	4	0
Cedar Creek	14	0	0	12	2
Cut Bank	125	111	19,622	2	12
Devon	4	0	0	4	0
Dunkirk	1	0	0	0	1
Frannie	1	1	35	0	0
Grassy Butte	1	0	0	1	0
Hardin	2	0	0	2	0
Kevin-Sunburst	83	48	5,315	10	25
Mosby	1	0	0	0	1
North Pendry	1	0	0	0	1
Soap Creek	1	0	0	0	1
Winifred	1	0	0	1	0
Vaughn	1	0	0	0	1
Whitlash	2	0	0	1	1
Miscellaneous	2	0	0	0	2
Total 1941	283	160	24,972	71	52

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NEW FIELDS IN NORTHERN SECTOR REVERSE PRODUCTION DECLINE

By OTTO PRESSPRICH

FOR the first 6 months of the year, Michigan's activity was largely confined to stemming a slow but steady decline in production. Then Winterfield and Reed City began reporting large producers and large allowables from these wells started production on an upward trend that registered nearly 50 per cent above January's level by November. Lowered allowables in December slightly reversed this trend but prospects are bright for a higher level in 1942 than in 1941.

Reed City was discovered late in 1940 but aroused little interest as the discovery was a relatively small well. In June of this year, Pure Oil Co. got a small producer and decided to deepen to test the Dundee and Monroe, thereby opening up a major field in which there were 113 producers by the end of the year which have produced nearly 3,000,000 bbl. of oil. Both the Monroe and Traverse have proved prolific pays.

Towards the end of June, the Headquarters pool in Roscommon County was opened up by E. V. Hilliard's 6,000-bbl. well in the Traverse. Except for August and September, production from this field has remained at about 2,000 bbl. a day.

Some scattered discoveries were recorded from Allegan and other southwestern counties, but none appear likely to open up areas of major importance and production from this sector declined nearly 40 per cent between the beginning and end of the year.

Gulf's deep test in the Monitor area of Bay County stole the spotlight from the rest of the area as it located a new gas pay in the Salina and went on to find the Trenton dry. However, a Berea sand pool has been developed in the district, the first of importance in some years, and shallow production of 1,000 bbl. a day has been developed.

Wildcatting, which received practically no returns during the first half year has been greatly stimulated by the discoveries in the northern sector and will continue into the coming year. A number of gas fields have been opened up, among which Continental's Albion discovery should be mentioned. This is over 60 miles from the nearest production and is located west of the city of Jackson. New fields, mainly in Clare and Osceola counties, are being rapidly developed and have furnished welcome supplies to Michigan's growing natural-gas industry.

PRODUCTION, 1937-1941

Northern district:	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Reed City	.....	.....	.....	2,580	2,858,555	.....	1	113
Freeman-Redding	.....	882,182	4,890,802	4,496,313	1,968,868	.....	145	144
Adams	13,414	54,547	54,297	322,073	1,123,373	.....	25	31
Winterfield	.....	.....	.....	10,969	1,113,556	.....	2	13
Buckeye	6,428,299	7,346,607	2,484,099	995,514	681,713	3	289	288
Ogemaw County	861,848	1,079,838	677,687	486,757	399,271	169	229	223
Clayton	1,029,667	1,180,738	690,032	436,438	280,610	1	51	50
Roscommon County	.....	.....	.....	.....	270,026	.....	.....	6
Beaverton	160,814	83,839	56,483	95,576	153,973	22	22	25
Bentley	7,339	215,191	189,387	121,456	99,058	.....	35	35
Edenville	.....	596,517	315,296	108,187	64,990	.....	26	26
Lincoln	.....	.....	.....	.....	2,930	.....	.....	1
Grant	.....	1,407	2,054	1,391	1,210	.....	3	.....
Total	8,501,381	11,440,866	9,360,137	7,066,285	9,018,133	195	828	923
Central district:								
Porter-Yost	3,865,049	2,658,552	1,962,449	1,771,602	1,527,509	421	340	337
Greendale	801,133	645,005	535,171	454,671	419,228	275	177	176
Wise	.....	8,052	262,031	849,807	374,719	.....	56	61
Sherman	1,532,312	1,166,695	435,267	462,844	284,306	2	61	61
Vernon-Leaton	684,394	431,928	308,476	254,006	266,041	106	76	73
Crystal-Wyman	572,807	272,320	157,208	108,265	108,063	134	34	34
Amble	.....	.....	.....	.....	38,497	.....	.....	3
Total	7,455,695	5,092,552	3,660,602	3,901,195	3,018,363	938	744	745
Western district:								
Walker	.....	.....	2,695,078	4,331,041	1,489,241	.....	457	474
Allegan County	520,664	2,401,625	2,789,238	2,709,939	1,439,703	6	516	552
Van Buren County	in Allegan	in Allegan	4,935,323	1,512,388	1,036,439	.....	287	283
Muskegon	77,466	46,005	37,595	27,326	19,110	105	57	56
Holland-Zeeland	.....	.....	10,626	12,971	4,640	.....	3	3
Barry County	.....	.....	.....	.....	1,425	.....	.....	1
Total	598,130	2,447,630	10,467,860	8,593,665	3,990,558	111	1,320	1,369
Eastern district:								
Bay County	.....	.....	.....	.....	180,277	.....	.....	8
Dundee	.....	7,258	16,261	104,332	84,602	10	14	18
Saginaw	24,210	19,568	31,453	40,022	18,335	65	56	51
Birch Run	36,315	19,980	14,102	9,542	9,343	24	25	25
Wisner-Tuscola	.....	3,616	8,304	558	3,390	.....	1	1
Genesee County	.....	.....	.....	.....	610	.....	.....	1
Total	60,525	50,422	70,120	154,454	296,527	99	96	104
State total*	38,438,072	36,008,527	23,566,406	19,747,968	16,323,581	1,343	2,988	3,173
Daily average	105,309	98,653	64,565	54,104	44,722	.....	.....	.....

*Includes some production from fields now abandoned.

Completions by Counties

	Comp.	Oil	Prod.	Gas	Dry
Allegan	169	77	7,261	1	91
Alpena	1	0	0	0	1
Antrim	1	0	0	0	1
Arenac	41	24	23,471	5	12
Barry	6	1	125	0	5
Bay	31	26	3,556	0	5
Berrien	4	0	0	0	4
Calhoun	3	0	0	0	3
Cass	10	2	45	0	8
Cheboygan	1	0	0	0	1
Clare	75	30	12,726	10	25
Clinton	1	0	0	0	1
Eaton	1	0	0	0	1
Genesee	2	1	12	0	1
Gladwin	18	11	1,475	0	7
Gratiot	13	0	0	2	11
Hillsdale	2	0	0	0	2
Huron	5	0	0	0	5
Ingham	1	0	0	0	1
Iosco	1	0	0	0	1
Kalamazoo	4	0	0	0	4
Kalkaska	2	0	0	0	2
Kent	20	7	306	5	8
Isabella	43	7	1,732	19	17
Lake	8	3	2,270	1	4
Lenawee	5	0	0	0	5
Livingston	3	0	0	0	3
Macomb	1	0	0	0	1
Manistee	1	0	0	0	1
Mason	2	0	0	2	0
Mecosta	6	0	0	0	4
Midland	12	6	751	4	2
Missaukee	11	0	0	5	6
Montcalm	31	3	535	2	8
Montmorency	2	0	0	0	2
Monroe	10	2	100	0	8
Muskegon	3	0	0	0	3
Newaygo	2	0	0	0	2
Oakland	1	0	0	0	1
Oceana	4	0	0	0	4
Osceola	161	113	396,715	25	23
Otsego	2	0	0	0	2
Ottawa	69	42	2,643	1	26
Roscommon	16	12	44,340	0	4
St. Clair	1	0	0	0	1
St. Joseph	1	0	0	0	1
Saginaw	2	0	0	0	2
Shiawassee	3	0	0	0	3
Tuscola	4	1	50	0	3
Van Buren	133	72	6,394	0	61
Total 1941	949	440	497,842	88	421

Completions by Months

	Comp	Oil	Gas	Dry	Footage
January	61	27	3	31	116,266
February	77	28	3	46	157,649
March	65	20	3	42	118,950
April	72	27	10	35	120,355
May	75	30	6	39	146,675
June	62	19	4	39	121,582
July	71	36	7	28	159,537
August	85	41	6	38	185,725
September	87	37	10	40	195,489
October	78	46	8	24	217,688
November	111	68	15	28	238,916
December	105	61	13	31	256,515
Total	949	440	88	421	2,045,337

PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

Field—	Total	Dly av.	January	February	March	April	May	June	July	August	September	October	November	December
Reed City	2,858,555	7,832	651	756	1,147	4,410	3,937	73,980	122,388	238,390	471,690	688,076	602,130	651,000
Freeman-Redding	1,968,868	5,393	244,435	202,132	209,777	190,110	177,661	166,770	153,295	135,625	129,480	139,531	112,110	107,942
Porter-Yost	1,527,509	4,185	141,918	127,848	141,639	101,340	138,725	134,310	132,959	122,977	126,990	124,248	115,980	118,575
Walker	1,489,241	4,080	187,860	147,448	150,877	144,960	121,799	141,870	121,706	110,019	99,180	99,882	83,040	80,600
Allegan County	1,439,703	3,972	155,310	133,644	135,780	132,480	119,474	120,030	120,218	100,409	96,120	98,518	112,710	115,010
Adams	1,123,373	3,078	71,517	86,268	107,384	105,600	104,718	102,930	89,001	85,994	94,530	95,511	88,470	91,450
Winterfield	1,113,556	3,023	3,782	3,080	10,819	41,880	78,957	76,710	106,888	126,573	140,310	167,617	168,690	178,250
Van Buren County	1,036,439	2,839	97,030	80,556	87,203	86,190	87,575	92,430	86,428	90,334	86,670	87,358	77,940	76,725
Buckeye	681,713	1,868	70,277	53,396	60,977	54,750	59,241	53,760	59,179	54,498	71,130	51,925	46,080	46,500
Greendale	419,228	1,149	36,115	31,724	37,107	36,240	34,069	36,240	35,774	34,286	37,110	36,208	32,580	31,775
Ogemaw County	399,271	1,094	36,704	32,732	33,852	36,210	36,487	32,130	33,790	35,030	30,810	32,736	29,340	29,450
Wise	374,719	1,027	44,330	36,092	40,889	34,140	35,402	31,320	28,830	28,272	24,930	26,164	22,650	21,700
Roscommon County	270,026	1,467	.....	.....	.....	.....	.....	.....	60,295	21,607	18,570	56,234	54,420	58,900
Bay County	180,277	1,178	.....	.....	.....	.....	.....	.....	.....	17,980	19,590	28,923	29,700	34,100

ANADARKO BASIN PLAY STARTS; OLD AREAS REWORKED

By ROBERT INGRAM

GRADUAL decline of most of the major producing areas in Oklahoma during 1941 was offset by the drilling of a large number of small structures in such areas as Greater Seminole, Okfuskee and Creek counties and the Osage district as well as by successful exploration of areas less developed—notably the Anadarko basin to the west.

The reworking of the old producing fields was largely responsible for the high rate of drilling maintained almost throughout the year. It was also responsible for the unusually large number of discoveries but by year's end it had made no change in the long-time production picture for the state. Oil produced from these areas was just about holding its own.

In the southwest, however, discovery of excellent production from Simpson sands (probably Wilcox) at Apache and Velma went a long way toward confirming the belief that Wilcox production would be found on suitable structures in most of the Anadarko basin. This revived a prospecting campaign throughout western Oklahoma which was expected to continue for some time.

Key to the campaign was the Apache pool itself which was discovered late in June and by year's end had eight producing wells with potentials ranging as high as 15,000 bbl. a day. The Corporation Commission fixed the Apache allowable for the month of January at 4,000 bbl. a day, and completion of a pipe line from Apache to Greater Seminole was expected in a few weeks which would permit a greatly increased production.

South of the pool, the Texas Co., which made the discovery and held large blocks of leases stretching for miles northwest and southeast, drilled four wildcats, three of which were dry and the fourth still drilling at year's end. Denver Producing & Refining Co. also had a wildcat under way in the same general area. All of these tests were located on what became known as the Apache trend.

Other major companies which had been slow to take much interest in that part of the state were taking leases toward the end of the year and exploration was expected to proceed at an even faster pace during 1942.

Two deep tests in Caddo County were being watched closely for geological information which might throw some light on the subsurface of the basin which has so far remained pretty much of a mystery. Denver Producing & Refining Co. started deepening an old dry hole at Binger from 10,000 ft. (not the Binger producer) and was planning to set a new world's record for depth by testing all formations to well below 15,000 ft. The other deep test was Amerada 1 Sprague, SE NW 11-8-12w, projected as a 12,000-ft. test.

Gulf Oil Corp. was the first of a number of companies holding acreage in the Panhandle to start a well. The Panhandle play, like that in Caddo and Comanche counties, was related regionally to the Anadarko basin and was in search of oil in a part of the basin about which very little is known.

(Continued on Page 186)

OKLAHOMA DISCOVERIES DURING 1941

Pool and county—	Location	Discovery well	Month	No. wells	Prod. formation	Top	Depth	Initial yield
East Pawnee, Pawnee	1-21-5	Alma Oil 1-A Hill	January	2	Wilcox	3,363	3,370	500
North Okemah, Okfuskee	36-12-9	Selden Henry 1 Dudgeon	January	3	Gilcrease	3,055	3,297	669
West Okemah, Okfuskee	20-11-9	Fred Coogan 1 Davis	January	4	Hunton	3,912	3,916	82
North Little River, Seminole	30- 8-7	Atlantic and Delaney 1 Clark	January	5	Wilcox	4,272	4,289	188
West Maud, Pottawatomie	32- 8-5	Kerlyn Oil 1 Cherry	February	9	Wilcox	4,320	4,330	155
Guthrie, Logan	7-17-1w	Hamilton, Fain 1 Donoghue	March	26	Wilcox	5,425	5,445	2,160
Castle, Okfuskee	6-11-9	K. G. F. F. Oil 1 Camp	March	2	Hunton	3,915	4,008	240
East Stroud, Creek	32-15-7	Lewis Production 1 Jones	March	45	Prue	2,808	2,850	105
West Fish, Seminole	14- 7-7	Weldon Hall 1-A Jackson	March	2	Booch	3,168	3,192	44
Sheppard, Seminole	4- 8-8	Alma Oil 1 Borden	March	2	Cromwell	3,310	4,326	25
Tecumseh Lake, Pottawatomie	36-10-3	Hall-Jordan 1 Whitehead	April	12	Wilcox	5,234	5,245	2,610
West Bethel, Seminole	14- 9-7	P. J. McIntyre 1 Brown	April	6	Wilcox	4,333	4,337	162
North St. Louis, Pottawatomie	27- 8-4	Amerada 1 Peters	April	16	Hunton	3,863	4,346	766
West Arno, Creek	35-14-7	Wilcox Oil & Gas 1 Stephney	May	6	Sand	2,900	4,007	100
Mason, Okfuskee	15-12-9	Texas Co. 1 Butcher	May	2	Cromwell	3,310	4,606	100
Hotulke, Pottawatomie	13- 9-4	Anderson-Prichard 1 Hood	May	15	Hunton	4,122	4,152	240
West Loco, Stephens	8-3s-5w	H. J. Brown 1 Lowery	June	6	Sand	1,000	1,856	35
East Orlando, Payne	12-19-1w	Olean 2 Lowry	June	2	Misener	4,745	4,782	154
Noble, Cleveland	13- 7-2w	W. H. Delaney 1 Montgomery	June	1	Wilcox	7,640	7,650	215
East Tecumseh, Pottawatomie	16- 9-4	Crosbie and Atlantic 1 School land	June	8	Viola	4,580	4,722	587
Velma (deep), Stephens	35-1s-5w	Skelly 4 Robberson-Frensley	June	1	Simpson	7,140	7,797	132
Apache, Caddo	2- 5-12w	Texas 2 Smith	June	7	Simpson	3,388	3,410	2,600
Southwest Nuyaka, Okmulgee	6-13-11	R. L. Vincent 1 West	June	1	Misener	3,168	3,176	100
East Okemah, Okfuskee	14-11-10	Alma Oil 1 Replogle	June	3	Cromwell	3,193	3,215	40
South Dill, Seminole	22-11-8	Shell 1 Keyes-B	July	2	Hunton	4,090	4,347	494
Northeast Wewoka	16- 8-8	Magnolia 1 Davis	July	5	Wilcox	4,218	4,282	23
North Castle, Okfuskee	15-12-9	Texas 1 McKernan	July	1	Wapanucka	3,283	3,304	147
West Hotulke, Pottawatomie	21- 9-4	Sharp 1 Billington	July	13	Viola-Hunton	4,500	4,540	270
Navina, Logan	17-15-3w	Continental 1 Lenigar	July	1	Hunton	5,250	6,422	80
Otoe City, Noble	16-22-1	Superior Oil 1 Faubian	July	3	Wilcox	4,728	4,925	205
East St. Louis, Pottawatomie	16- 7-5	Helmerich & Payne 1 School	July	6	Dolomite	4,045	4,054	460
Sinclair, Creek	34-17-8	Zephyr 1 Sinclair	July	4	Prue-Red Fork	2,330	2,387	73
East Wetumka, Hughes	13- 9-10	Potco 1-A Morrison	August	1	Hunton		3,738	580
East Okemah, Okfuskee	3-11-10	Shelton 1 Armstrong	August	2	Cromwell	3,260	3,380	70
Northeast Mehan, Payne	13-18-3	T. N. Berry 1 fee	August	1	Wilcox	4,100	4,103	110
North Davenport	29-15-5	Dunnett Oil 1 Luckenbill	September	7	Prue	3,504	3,550	43
Rusk (Walnut Bend), Okfuskee	7-11-8	D. B. Malernee 1 Beard	September	7	Cromwell	3,691	3,710	748
Harper, Oklahoma	17-14-2w	Harper-Turner 1 Harper	September	4	Chicken Farm	5,882	5,925	35
South Castle, Okfuskee	17-11-9	Shell 1 Hefner	September	1	Hunton	3,872	3,962	427
West Peck, Lincoln	31-14-6	Mid-Continent 1 Evans Land	October	1	Hunton	4,546	4,565	138
Guthrie-Bartlesville, Logan	12-17-2w	Sunray 1 McLeod	October	2	Bartlesville	5,109	5,123	120
Sylvian, Seminole	11-10-7	Stanolind 1 Buck	October	1	Wilcox	4,368	4,435	118
....., Seminole	33-10-8	Mico Oil & Gas 1 Kidd	December	1	Sand	2,145	3,767	40
East Tecumseh-Wilcox, Pottawatomie	16- 9-4	Atlantic 3 Lee	December	1	Wilcox	4,835	4,849	198
....., Creek	16-15-7	Deep Rock 1 Meadors	December	1	Wilcox	3,951	3,985	134
....., Seminole	29- 8-6	Donmar Oil 1 Smith	December	1	Hunton	4,360	4,390	45
EXTENSIONS TO OLD AREAS								
Fish, Seminole	19- 7-8	Mid-Continent 1 Fish	May	4	Calvin	1,478	1,573	150
East Cromwell, Okfuskee	36-11-8	Titus 1 Canaday	August	35	Cromwell	3,438	3,483	10
Depew, Creek	7-15-8	Charles F. Balph 1 Starr	September	3	Wilcox	3,792	3,815	175
West Hotulke, Pottawatomie	22- 9-4	Atlantic 1 Higbee	October	1	Wilcox	4,629	4,647	629
Romulus, Pottawatomie	6- 7-4	Young 1 Brown	November	1	Hunton	3,970	4,005	300
Byars, McClain	16- 5-3	Patsy Oil 4 Caldwell	December	1	Viola	3,550	3,679	210

PRODUCTION OF MAJOR FIELDS, JANUARY-DECEMBER 1941

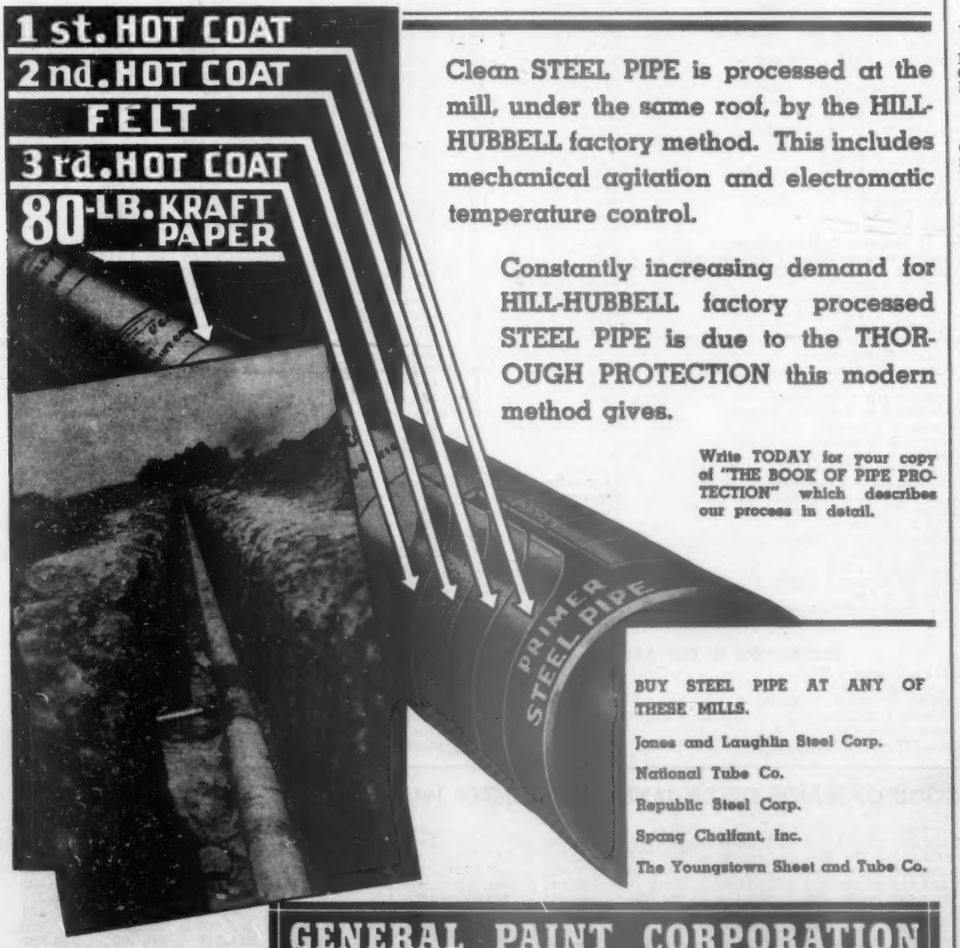
Field—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Oklahoma City	32,183,700	88,174	2,791,057	2,537,963	2,748,223	2,710,199	2,760,782	2,771,945	2,770,430	2,695,552	2,575,995	2,545,107	2,577,848	2,698,599
St. Louis	6,897,400	18,896	597,813	534,112	601,067	544,890	542,779	542,108	560,019	576,621	593,931	601,261	599,038	603,761
Fitts-Wilcox	4,125,538	11,302	397,679	356,199	388,681	372,670	361,049	365,811	344,242	334,445	313,211	304,087	297,806	289,640
Hewitt and West	4,860,000	13,315	247,628	235,312	286,874	292,080	334,955	359,141	401,692	468,230	519,119	589,901	575,030	560,038
Cement	3,353,600	9,188	209,124	213,420	211,559	196,656	251,676	243,434	277,677	242,137	340,927	389,341	407,282	370,367
Burbank	3,281,500	8,990	250,876	234,976	265,515	266,640	278,473	279,623	276,131	272,081	264,236	266,099	263,388	263,462
Cushing	3,222,500	8,829	273,761	249,676	282,751	272,940	284,022	281,960	278,413	269,908	261,342	248,003	262,898	256,826
Healdton	3,085,700	8,454	267,561	239,496	266,910	254,910	268,894	262,661	263,819	267,335	253,030	264,848	243,000	233,236
South Burbank	2,659,800	7,287	227,503	202,597	226,294	214,808	219,912	215,286	223,994	227,744	224,400	231,507	218,180	227,575
Cumberland	2,442,600	6,966	134,890	167,975	187,972	194,681	206,573	223,881	201,439	216,538	210,457	217,530	210,783	269,881

OKLAHOMA PRODUCTION, 1937-1941

	1937	1938	1939	1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Washington County:								
Miscellaneous	1,296,401	1,258,087	1,243,722	1,236,153	1,394,900	5,242	4,648	4,596
Nowata County:								
Miscellaneous	3,450,459	4,390,178	4,347,718	1,306,064	3,995,200	6,975	7,473	7,402
Rogers County:								
Miscellaneous	635.947	675,732	765,517	761,712	921,500	3,446	3,452	3,469
Osage and eastern Kay counties:								
Burbank	2,870,872	2,814,206	2,688,669	2,838,430	3,281,500	1,935	1,703	1,696
South Burbank	5,579,341	3,938,143	3,150,270	2,927,350	2,779,800	240	239	224
Naval Reserve	2,136,486	1,703,876	1,438,278	1,288,130	1,088,900	237	236	234
Other Osage pools	5,489,233	4,734,511	4,625,005	4,615,788	5,042,600	6,654	6,134	6,022
Total Osage	16,075,932	12,790,736	11,902,222	11,669,698	12,192,800	9,066	8,312	8,176
Tulsa County:								
Miscellaneous	1,720,781	1,513,290	1,073,453	1,064,594	1,053,100	3,596	3,400	3,289
Wagoner County:								
Miscellaneous	284,521	280,866	253,855	253,780	245,100	471	483	486
Okmulgee County:								
Miscellaneous	1,751,626	1,753,190	1,476,962	1,410,240	1,213,700	2,400	2,155	2,104
Muskogee and McIntosh counties:								
Miscellaneous	341,163	314,625	280,697	291,601	300,500	662	542	502
Eastern Okfuskee County:								
Miscellaneous	943,620	850,720	762,427	1,186,770	1,263,500	397	400	421
Seminole district: Okfuskee, Hughes, Pottawatomie, and Seminole counties:								
Dill	640,063	404,641	358,370	634,852	1,426,400	22	54	86
Olympic	4,315,466	1,888,833	1,033,757	739,280	597,900	221	332	324
Rusk	.....	.....	.....	.....	116,100	.....	.....	7
Miscellaneous	.....	.....	.....	.....	1,782,600	.....	.....	73
Total Okfuskee	4,955,529	2,293,474	1,392,127	1,374,132	3,923,000	243	386	490

Let's Dissect

and see what the HILL-HUBBELL PROCESS OF PROTECTION IS • •



Clean STEEL PIPE is processed at the mill, under the same roof, by the HILL-HUBBELL factory method. This includes mechanical agitation and electromatic temperature control.

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Jones and Laughlin Steel Corp.

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An installation of 4½ inch O.D. HILL-HUBBELL protected STEEL PIPE at Gadsden, Alabama.

GENERAL PAINT CORPORATION
HILL, HUBBELL & CO. • Division • Cleveland, Ohio
• EXPORT OFFICE SAN FRANCISCO, CALIFORNIA, U. S. A. •

1940	1941	Number of wells 1-1-37	1-1-41	1-1-42
Adams	173,884	267,164	260,992	
Fish	2,077,047	1,223,950	1,376,346	
Miscellaneous	(*)	(*)	(*)	
Total Hughes	2,250,931	1,491,114	1,637,338	
Avoca	.....	21,431	183,643	
Hotulke and W.	.....	.....	.....	
West Maud	.....	.....	.....	
Maud	281,882	233,104	274,056	
Romulus	.....	.....	.....	
St. Louis, N. and E.	7,527,756	7,766,496	11,302,516	
Shawnee	480,168	465,397	412,924	
Tecumseh Lake	.....	.....	.....	
East Tecumseh	.....	.....	.....	
Miscellaneous	(*)	(*)	(*)	
Total Pottawatomie	8,289,806	8,486,428	12,173,139	
Bethel and N.	962,298	783,686	751,617	
Bowlegs	4,178,171	3,199,725	2,678,022	
Carr City	1,973,134	1,293,981	922,127	
Cromwell, N. and S.	1,265,008	1,287,597	1,175,266	
Dora	204,659	1,732,383	1,153,413	
Earlsboro district	2,944,689	3,751,151	3,590,154	
Keokuk	2,978,612	1,712,945	1,176,055	
Konawa, E., W., S.	592,278	568,775	655,832	
Little River, E. and W.	4,221,863	3,040,364	2,865,156	
North Little River	.....	.....	.....	
Mission	778,105	559,473	485,774	
Sasakwa	720,279	676,844	475,531	
Searight, E. and N.	1,628,281	1,065,872	832,560	
Seminole City	3,428,077	2,841,656	2,618,330	
East Seminole	885,950	580,970	446,284	
West Seminole	5,598	763,092	499,814	
Wewoka district	1,120,818	848,156	746,414	
Miscellaneous	(*)	(*)	(*)	
Total Seminole	27,887,820	23,922,984	21,072,349	
Pontotoc County:				
Allen district	2,511,447	2,475,413	2,289,476	
Bebee, and E.	928,381	1,017,139	1,005,224	
Fitts	30,976,949	16,655,367	9,119,925	
Jesse	1,153,051	1,041,915	813,822	
Total Pontotoc	35,569,828	21,189,834	13,228,447	
Miscellaneous area	5,534,676	3,043,271	2,757,664	
Total Seminole area	84,434,590	60,427,105	52,261,064	
Marshall and Bryan counties:				
Cumberland	.....	.....	.....	
Miscellaneous	84,784	56,314	52,210	
Total	84,784	56,314	52,210	
Creek County:				
Bristow and Slick	2,790,251	2,389,025	2,402,743	
Cushing-Shamrock	3,908,408	3,847,633	3,446,230	
Glenn Pool-Sapulpa	1,565,709	1,487,943	1,430,276	
Manford-Olive	702,803	797,948	700,466	
East Stroud	.....	.....	.....	
Miscellaneous	565,424	417,324	623,080	
Total	9,532,595	8,939,873	8,602,795	
Pawnee and Payne counties:				
Yale district, Maramec, and Jennings	1,509,355	1,311,924	1,256,110	
Ramsey	.....	528,093	1,488,646	
Coyle	.....	.....	385,533	
Miscellaneous	1,121,353	1,193,565	1,203,461	
Total	2,630,708	3,033,582	4,333,750	
Lincoln County:				
Chandler and Hoyt	1,122,834	754,723	521,644	
Sac and Fox	.....	609,183	1,113,621	
Miscellaneous	1,507,838	1,605,146	1,190,661	
Total	2,630,762	2,696,052	2,825,926	
Oklahoma County:				
Oklahoma City	54,776,210	38,795,958	35,728,192	
Edmond	5,884,427	2,030,282	1,675,282	
Britton	713,314	302,703	259,839	
Miscellaneous	.....	11,466	34,769	
Total	61,373,951	41,128,943	37,698,082	
Cleveland County:				
Moore	3,895,797	1,756,230	1,000,371	
Miscellaneous	.....	21,389	12,297	
Total	3,895,797	1,777,619	1,012,668	
Kay, Grant, and Noble counties, Blackwell district:				
Creek, Otsot, Caldwell, Webb	360,616	351,295	305,454	
Braman, N. and SE.	841,674	745,058	533,351	
Billings	2,348,511	2,107,749	2,178,265	
Lucien	5,046,528	3,324,328	3,017,480	
North Lucien	142,631	199,539	251,920	
Polo	431,726	237,198	427,387	
Tonkawa	868,201	759,255	678,225	
Miscellaneous	980,464	943,047	827,460	
Total	11,020,351	8,667,469	8,219,542	
Garfield County:				
Garber	760,661	723,169	657,829	
Miscellaneous	39,110	40,009	102,325	
Total	799,771	763,178	760,154	
Logan County:				
Crescent	3,851,687	1,686,602	982,832	
Guthrie	.....	.....	.....	
Miscellaneous	573,457	499,403	356,004	
Total	4,524,144	2,186,005	1,338,836	
Stephens and Cotton counties:				
Duncan district	729,111	857,922	900,534	
Loco-Milroy	337,807	318,387	194 945	
Velma	299,831	273,456	282,688	
Walters	420,428	369,429	352,229	
Miscellaneous	284,254	325,445	332,243	
Total	2,071,431	2,144,639	2,062,639	
Carter County:				
Graham-Fox	1,093,429	1,078,572	1,046,131	
Healdton	3,653,768	3,400,926	3,236,484	
Hewitt and W.	1,583,224	1,399,899	1,361 878	
Sholem-Alechem	1,157,316	984,822	943,690	
Tatums and Tussy	1,971,718	1,264,305	755,588	
Wildcat Jim	558,316	451,311	188,661	
Miscellaneous	180,888	136,329	105,088	
Total	10,198,659	8,716,664	7,637,520	
Caddo County:				

1940	1941	1937	1938	1939
269,632	265,000	4	10	10
1,152,670	1,359,300	93	131	143
(*)	667,500	.....	.....	248
1,422,302	2,291,800	480	406	401
367,228	619,405	.....	10	18
.....	189,435	.....	.....	17
.....	286,200	.....	.....	9
203,913	223,700	72	57	57
88,204	820,520	...	3	17
9,330,579	6,997,400	624	890	902
808,658	473,400	9	58	58
.....	485,800	.....	.....	12
.....	319,700	.....	.....	7
(*)	1,563,340	.....	.....	166
10,798,582	11,978,900	820	1,136	1,245
756,728	655,500	39	64	62
2,464,267	2,134,200	244	222	210
839,883	791,000	100	84	79
1,356,714	1,457,100	273	262	260
741,209	433,300	23	108	113
3,729,866	3,757,300	362	367	364
1,090,558	1,028,900	100	101	98
765,510	1,245,000	104	139	158
2,875,401	2,704,600	354	320	315
.....	137,600	.....	.....	5
459,793	448,900	73	66	63
426,192	330,000	66	67	64
775,748	662,800	94	79	75
2,500,602	2,242,900	234	206	199
426,598	328,900	80	97	93
489,452	696,400	26	25	34
607,597	657,400	156	132	127
(*)	363,910	.....	.....	417
20,306,118	20,075,710	2,067	2,030	2,022
2,065,591	1,779,700	456	507	495
1,827,596	1,525,700	144	250	251
6,246,313	4,223,400	552	856	785
781,570	708,500	19	66	62
9,062,070	8,442,490	1,171	1,679	1,593
5,533,739	.....	837	764	.....
48,496,943	46,711,900	4,781	5,634	5,756
392,988	2,542,600	...	16	42
56,945	44,900	166	161	158
449,933	2,587,500	166	177	200
2,212,927	1,951,400	1,256	1,174	1,148
3,352,616	3,222,500	2,037	1,819	1,783
1,458,889	1,483,300	2,039	1,970	1,953
596,143	508,300	439	472	466
.....	542,800	.....	2	45
715,250	753,400	.....	.....	.....
8,335,825	8,461,700	6,332	5,959	5,919
1,307,055	1,280,900	629	535	519
1,376,640	1,548,800	.....	38	42
636,961	1,467,500	.....	33	35
1,378,577	1,058,800	869	837	800
4,699,233	5,356,000	1,498	1,443	1,396
402,342	322,500	73	60	57
707,171	401,500	...	140	141
1,243,546	1,059,600	289	250	266
2,353,059	1,783,600	362	450	464
35,970,314	32,183,700	1,073	1,008	1,000
1,488,027	1,223,600	74	84	83
252,598	138,900	21	31	29
51,568	110,800	2	6	9
37,762,507	33,657,000	1,170	1,129	1,121
599,446	326,600	14	38	32
675	25,600	.....	1	2
600,121	352,200	14	39	34
255,025	228,800	195	152	149
506,642	504,900	84	95	91
2,209,087	2,275,800	17	95	94
2,750,180	2,068,800	93	123	122
235,264	114,800	1	12	12
386,968	302,000	37	31	28
623,796	632,100	443	210	189
880,804	925,900	200	116	113
7,747,766	7,051,100	1,076	834	798
632,183	619,600	606	572	563
114,770	78,800	13	8	8
746,953	698,400	629	580	571
769,125	576,100	45	40	34
.....	752,600	.....	.....	28
365,091	768,800	50	60	60
1,134,216	2,097,500	95	100	122
1,046,361	1,115,100	514	494	505
266,748	281,400	218	207	206
266,834	296,700	649	635	646
333,654	303,300	255	248	243
243,161	239,500	295	192	192
2,156,758	2,236,000	1,931	1,776	1,792
933,491	845,000	397	371	361
3,177,027	3,085,700	1,891	1,912	1,898
1,778,272	4,860,000	796	805	916
1,002,678	902,300	337	319	315
1,165,951	1,923,600	252	305	317
167,832	168,300	76	88	88
110,777	112,400	176	181	201
8,336,028	11,897,300	3,925	3,981	4,096

1940	1941	Number of wells 1-1-37	1-1-41	1-1-42	1937	1938	1939
Apache	.....	.....	.....	.....	273,800	.....	8
Cement and misc.	...	781,868	1,336,128	1,825,974	2,468,689	3,353,600	224	320	362
Total	....	781,868	1,336,128	1,825,874	2,468,689	3,627,400	224	320	370
Kiowa County:									
Hobart	.....	.....	.....	.....	10,814	883,700	.....	10	30
Miscellaneous	.....	.....	.....	49,767	.....	.....	.....	.....	.....
Total	.....	.....	.....	49,767	10,814	883,700	.....	10	30
Jefferson County:									
Miscellaneous	....	1,019,986	827,967	456,013	687,738	601,200	207	274	274
Coal County:									
Miscellaneous	.....	26,408	78,393	184,075	33,716	32,500	3	5	7
Love County:									
Miscellaneous	....	.....	12,712	7,562	5,439	9,100	1	1	1
Gravin County:									
Miscellaneous	....	418,374	471,119	376,043	202,340	319,000	192	177	176
Grady County:									
Miscellaneous	...	533,055	609,208	596,265	717,337	643,900	143	169	177
Tillman County:									
Miscellaneous	....	238,099	419,002	495,978	621,540	1,073,300	100	113	122
Jackson County:									
Miscellaneous	..	385,132	344,384	578,311	728,631	557,000	56	154	171
Comanche County:									
Miscellaneous	..	6,653	1,607	2,186	5,219	4,400	8	111	100
McClain County:									
Miscellaneous	.....	.....	.....	.....	285,974	35,400	.....	10	5
Total	.....	223,107,568	168,465,387	153,483,833	150,767,391	153,257,400	55,168	54,304	54,147

*Prior to 1941 "Miscellaneous" pools in Greater Seminole district not allocated to counties.

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UNCLE SAM'S paratroopers, going "downstairs" on business, carry three square meals on one small pocket of their uniforms.

It's very special food — powdered, concentrated — calories carefully counted—but complete from soup to coffee. It gives husky men the *reserve power* to keep going when other supplies are cut off.

Reserve power is as vital in industrial as in military emergencies. When defense plants began to eat up more and more electric power, *reserve rations were ready.*

Reserves built up in advance by the business men who manage America's power companies.

Reserves that met almost every defense demand overnight.

But *no* power reserves could continue to satisfy hungry machines indefinitely. So the electric companies have been working fast to keep ahead. They put over 2½ *million more horsepower* into production during 1941.

Here is a basic defense industry, able and willing to do its part —glad to pledge all-out co-operation with government and industry — *until the skies and seas around America are free forever!*

SOUTHWESTERN GAS & ELECTRIC COMPANY

In the older areas, Guthrie, Tecumseh Lake, Hotulke and West Hotulke were the outstanding new pools, but none appeared to have major importance or to rank with the Apache strike. Nonetheless, the Hotulke district and the East Cromwell extension district took a lion's share of the field drilling during the second half of the year while drilling practically stopped at West Hewitt in Carter County after a real boom during the first 6 months.

In addition to the drilling on small structures, secondary-recovery methods were introduced to hold production to about its present level. Gas repressuring of the Sinclair Prairie Kiefer lease in the 35-year-old Glenn Pool field in Creek County proved the success of that method in that area and after a year's operation, was extended to cover a large area in the field and several operators cooperated in the project. More of this type of work was expected in many parts of Oklahoma, and was being planned for Oklahoma City in spite of a legislative setback which stymied attempts to unitize the field before secondary recovery was started.

Concurrent with the increased interest in the development of the oil fields in the southwestern part of the state, construction of a new gas line from Cement provided additional outlets for the large reserves in that field. Development of Chickasha also quickened following the completion of producers of record size in the Charlson sand. The plan to repressure the Wilcox sand of Oklahoma City with gas from this area has been dropped temporarily but the increased reserves of gas now available may lead to a revival of interest in the plan.

"Low upkeep cost"
is not enough!
Throughout the oil fields, Twin Disc Heavy-Duty Clutches and Power Take-offs are recognized for their low upkeep costs . . . that's one reason why better than 9 out of 10 builders of oil field equipment continue to standardize on Twin Disc Clutches.
But the Twin Disc Clutch Company does not take full advantage of this situation . . . they protect these manufacturers by maintaining adequate parts stations throughout the oil fields, in addition to factory branches at Dallas, Tulsa and St. Louis. Thus you are doubly protected—first, by a clutch whose long life and low maintenance is a matter of record; second, by quickly available parts and service should occasion demand them. TWIN DISC CLUTCH COMPANY, 1328 Racine St., Racine, Wisconsin.
AT LEFT: Twin Disc Model E Clutch, heavy-duty, enclosed type. Sizes: 14" to 42" in single or two-plate assemblies.
BELOW: Twin Disc Power Take-off for engines having up to 285 hp. output. Sizes: with single plate clutches, 6½" to 24"; double plate, 11½" to 18". Housing sizes: No. 6 S.A.E. to No. 00 S.A.E.
TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES
REG. U.S. PAT. OFF.

OKLAHOMA

Summary of Wells Completed During 1941

Pool—	Comp.	Oil	Prod.	Gas	Dry
Allen	10	6	139	0	4
Altus	28	15	906	1	12
Apache	7	7	28,081	0	0
Asher	1	1	190	0	0
W. Arno	5	2	236	3	0
Avoca	7	5	1,663	0	2
Bebee & E.	30	29	4,498	0	1
No. Bristow	1	1	55	0	0
Burbank	6	6	774	0	0
So. Burbank	1	1	150	0	0
Byars	1	1	210	0	0
Calvin	3	3	104	0	0
Castle & N.	2	2	397	0	0
Cement	52	43	15,909	5	4
Centrahoma	3	0	0	3	0
Chickasha	11	0	0	9	2
Comanche	3	3	157	0	0
Cowan	1	1	80	0	0
Coyle	4	3	575	0	1
East Cromwell	41	35	18,177	1	5
Cumberland	31	31	8,261	0	0
West Davenport	11	7	461	0	4
Depew	3	3	227	0	0
Dill	46	35	10,444	0	11
So. Dill	1	1	494	0	0
Dilworth	3	3	150	0	0
Earlsboro dist.	23	21	3,911	0	2
Ed Cox	6	6	107	0	0
Empire	21	13	1,766	1	7
Enid	1	1	45	0	0
Fish	22	16	2,830	0	6
West Fish	3	1	44	0	2
So. Fitts	1	1	28	0	0
West Frederick	12	10	14,929	0	2
Guthrie	28	28	13,880	0	0
Harper	4	4	123	0	0
Healdton	13	10	290	0	3
Hewitt	129	119	35,019	0	10
Hill Top	2	0	0	1	1
Hobart	25	16	4,926	0	9
Holdenville	4	2	93	0	2
Holtulke district	29	27	6,871	0	2
Isom Springs	8	8	304	0	0
Knox	10	8	306	0	2
Konawa	5	4	2,801	0	1
Laffoon	9	2	115	7	0
Lamont	1	1	556	0	0
Langston	1	1	50	0	0
Lawton	1	0	0	0	1
Little River district	16	12	1,955	0	4
Loco and West	11	6	170	1	4
Lovell and South	0	0	0	6	2
Mason	3	1	46	0	2
West Maud	10	9	1,608	0	1
Navin	1	1	80	0	0
Noble	1	1	215	0	0
Okemah district	24	14	1,257	7	3
Oklahoma City	37	36	11,750	0	1
Olympic	1	0	0	0	1
Orlando	1	1	240	0	0
Otoe City	3	2	750	0	1
East Pawnee	3	1	500	0	2
Perkins	1	1	120	0	0
Prague	6	5	502	0	1
Ramsey	4	4	5,742	0	0
Rattlesnake	1	1	110	0	0
Romulus	2	2	584	0	0
Rusk	7	7	3,094	0	0
Sac and Fox	1	1	15	0	0
Sasakwa	6	4	236	0	2
Seminole	21	14	1,896	0	7
North Shawnee	1	0	0	0	1
Sinclair	1	1	55	0	0
St. Louis	73	55	18,541	2	16
East St. Louis	7	6	1,188	0	1
North St. Louis	18	16	6,786	0	2
East Stroud	41	39	6,356	0	2
Sylvian	1	1	118	0	0
Tecumseh Lake	15	12	6,710	0	3
East Tecumseh	10	8	2,544	0	2
Tussy	20	16	1,348	0	4
Velma	34	25	1,042	4	5
Weleetka	13	7	492	3	3
Wetumka	4	3	470	1	0
Wewoka	9	6	611	1	2
Miscellaneous:					
Carter	5	4	535	0	1
Creek	94	63	1,780	5	26
Hughes	6	2	696	0	4
Jackson	1	0	0	0	1
Jefferson	2	1	40	0	1
Kay	8	2	542	0	4
Latimer	13	0	0	12	1
Le Flore	6	0	0	5	1
Lincoln	10	4	328	4	2
Logan	1	0	0	0	1
McIntosh	4	0	0	3	1
Muskogee	55	14	130	12	29
Okfuskee	27	13	892	3	11
Okmulgee	109	48	1,001	24	37
Osage	111	81	5,693	3	27
Pawnee	29	14	263	9	6
Pittsburg	6	0	0	4	2
Pontotoc	23	14	249	3	6
Seminole	39	22	1,447	3	14
Stephens	14	7	233	0	7
Tulsa	78	39	904	8	31
Wagoner	45	5	86	10	30
Other	91	41	1,612	14	36
Wildcats	250	0	0	0	250
Total	2,110	1,235	279,024	178	697

Completions by Months

	Comp.	Oil	Gas	Dry	Footage
January	132	59	20	53	326,199
February	143	76	19	48	331,215
March	127	65	10	52	296,167
April	171	94	13	64	377,463
May	193	132	16	45	468,176
June	173	111	11	51	414,183
July	197	122	13	62	591,618
August	234	143	13	78	704,346
September	203	127	15	61	614,848
October	179	99	16	64	498,111
November	153	96	13	44	417,779
December	205	111	19	75	620,924
Total	2,110	1,235	178	697	5,661,029

Clayton Pool in Perry County Best Recent Ohio Discovery

OHIO witnessed a successful year during 1941 in spite of the more or less unsuccessful wildcat campaign carried on throughout the eastern section of the state. Total completions for all fields are up 34 per cent. The number of oil wells drilled increased 29 per cent with an initial production of 11,210 bbl., a 161 per cent increase over 1940. The increased demand for natural gas is reflected by the 83 per cent rise in gas completions. Total initial open flow was 533,000,000 cu. ft. A significant fact appears in that the dry holes drilled were two less than were drilled in 1940.

Southeast Ohio.—In oil development the Clayton pool (Pennsylvania Grade) in Perry County was the center of interest. Forty-five producers were drilled in the Clinton sand, extending the pool to cover approximately 5 sq. miles. Initial productions of the wells ranged up to 575 bbl., averaging 152 bbl., as against the state average of 14 bbl. The importance of the development of this field is reflected in that the total initial production of 6,870 bbl. of the pool is over half of the state's new production for 1941. To date this pool has been drilled under a well-considered spacing plan. While the southwestern, southern and southeastern extremities have possibly been more or less outlined by small wells and dry holes further extension will likely be attempted to the north and northeast.

In northwestern Perry County east of Thornville a Clinton oil pool has been developed. Eight wells were drilled during the past year with initial production ranging from 25 to 250 bbl., averaging 120 bbl. While only one dry hole has been drilled in the immediate vicinity, the area at present covers ½ sq. mile.

The Brush Creek gas pool underwent successful extensions and inside development, yielding 37 gas wells with open flows ranging up to 11,000,000 cu. ft. This area has been one of the most prolific pools developed in Ohio in recent years.

A number of wildcats were drilled in Muskingum County, the most promising discovery being a 12,000,000-ft. gasser west of Chandlersville in the Clinton sand at 4,100 ft. The potentialities of this discovery are yet to be determined.

Central Ohio fields.—The Newark gas field gives indications of having reached its peak during 1941. Ninety-seven completions were recorded, 84 Clinton wells, 6 Newburg gas wells and 17 failures. Some inside drilling remains to be done and minor extensions are probable.

The Hinckley pool, Medina County, was extended across the county line into Summit County; 13 gas wells were drilled averaging slightly less than a million cubic feet open flow. Three small Oriskany wells were also recorded.

Several water-flooding projects were undertaken in the secondary recovery development of the Berea sand in the Lodi (Chatham) field, Medina County, with success.

Wildcats.—The wildcat campaign for the most part has been confined to the untested eastern section of the state. The St. Peter horizon was reached by tests in Geauga, Wayne, Wood, and (2) Wyandot counties, the two last-named being in northwestern Ohio. All were failures. The Wayne County test, drilled in the old Wooster oil pool, had small oil showings in the Trenton and St. Peter horizons but were not responsive to acid or shot treatments. Numerous tests were made in the Clinton sand at the 5,000-ft. level and deeper in eastern Ohio; namely in Belmont, Harrison, Carrol, Mahoning, Tuscarawas, and Guernsey counties. Only the Harrison County, Washington Township, tests drilled by the East Ohio Gas Co. found gas pays warranting further testing of the immediate vicinity; subsequent offsets were dry. The deepest test in the state was dry, being carried through the Clinton horizon to a depth of 7,887 ft. in Belmont County. Other Clinton tests were drilled in Portage, Ashtabula, Stark and Morgan counties; the latter located in southeastern Ohio. The Oriskany was missing in Washington County test on the Cambridge anticline.

Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	122	31	53	38	235,917
February	96	17	55	24	180,000
March	110	33	55	22	227,456
April	132	39	50	43	221,222
May	144	26	61	57	290,797
June	153	47	60	46	318,834
July	142	29	63	50	309,817
August	137	35	60	42	260,195
September	169	41	83	45	351,204
October	148	37	73	38	274,344
November	180	53	74	53	372,108
December	120	31	45	44	312,476
Total 1941	1,653	419	732	502	3,354,370
Total 1940	1,227	323	400	504	.....
Difference	426	96	332	2	.....

Recompletions, 43.

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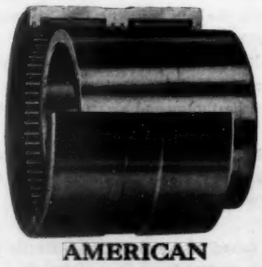

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Steps in Transition to Wartime Economy

By HENRY D. RALPH

WASHINGTON, D. C., Jan. 27.—For the United States as a whole, the year 1941 was a year of transition from a limited program of national defense to total war.

The relationship between the oil industry and the federal Government in large part paralleled, but in many respects anticipated, relationships between all U. S. industry and the Government. Starting with a relatively few and relatively mild measures threatening to disturb the normal functioning of industry, the year ended with complete federal control in its most drastic and detailed form. The oil industry was brought under formal federal control a few months earlier and more directly than most other industries not primarily engaged in armament production, but the operation of the priorities system, price control, and other defense regulations, and finally full wartime control under the emergency powers of the president, operated to bring every sort of business activity under the dictation of Washington.

Outstanding high spots in Washington events which affected the oil industry during 1941 are shown in the following brief chronology:

JANUARY 6.—President Roosevelt asked Congress for all-out aid to the democracies.

JANUARY 6.—The House continued the life of the Cole Petroleum Investigating Committee.

JANUARY 6.—Interstate Commerce Commission ordered crude-oil pipe lines to reduce their rates to a return of 8 per cent on valuation.

JANUARY 6.—Supreme Court upheld the Texas proration system.

JANUARY 7.—President Roosevelt created the Office of Production Management to take over the work of the National Defense Advisory Commission.

FEBRUARY 4.—Army and Navy made commitments for 1,000,000 bbl. of 100-octane gasoline and anticipated 25 per cent expansion in producing capacity would be required.

FEBRUARY 11.—President Roosevelt asked Cole Committee to investigate railroad opposition to construction of oil pipe lines.

FEBRUARY 15.—Presidential proclamation prohibited the exports of filled and empty oil drums except as licensed under the export control system.

MARCH 4.—Petroleum products were given unlimited licenses for export to Britain.

MARCH 11.—Lend-Lease bill became law.

MARCH 11.—Department of Justice and attorneys for defendants began long series of conferences in attempts to settle out of court antitrust suit against American Petroleum Institute and 22 major companies, and pipe-line rebate suit under the Elkins Act.

MARCH 11.—Temporary National Economic Committee released monograph by Department of Justice attorney suggesting federal control of the oil industry as a public utility.

MARCH 17.—Federal control of the oil and gas industries as a part of national economic planning recommended by the National Resources Planning Board.

MARCH 30.—Government seized Axis shipping in American ports.

MARCH 31.—Cole committee conducted hearings on pipe-line construction and was told that the oil industry was fully prepared for national defense.

MARCH 31.—Temporary National Economic Committee made final report to Congress including no recommendation whatever regarding the oil industry.

APRIL 7.—Cole Committee heard railroads and pipe lines argue the necessity for new pipe-line construction in southeastern states.

APRIL 28.—Growing shortages of materials and increased functioning of the priorities system threatened to interfere with supplies for the oil industry.

APRIL 28.—The House gave the Cole Investigating Committee another year to report on the oil industry.

MAY 5.—Cole Committee began drafting legislation to give oil pipe lines the right of eminent domain when needed for national defense.

MAY 10.—Readjustment of tanker movements began as a result of the British request for the loan of 25 tankers.

MAY 12.—Oil industry spokesmen opposed increases of the Federal Gasoline Tax at hearings of the New Revenue Bill.

MAY 20.—Plans were announced for construction of a large national-defense pipe line from Texas to the Atlantic Coast to offset shortage threatened by British request for more tankers.

MAY 27.—Leading marketers in eastern states agreed to request of Office of Price Administration and Civilian Supply not to make further price increases without prior consultation with OPACS.

MAY 31.—President Roosevelt appointed Secretary Ickes Petroleum Coordinator for National Defense.

JUNE 3.—OPM asked the oil industry to curtail the use of steel in production by one-fifth.

JUNE 6.—Ralph K. Davies was appointed Deputy Petroleum Coordinator, and the Office of Petroleum Coordinator began assembling a staff and developing policies.

JUNE 6.—The House passed the Cole Bill to expedite construction of pipe lines needed in national defense.

JUNE 10.—Major oil companies told the Maritime Commission they would construct a new fleet of tankers in shipyards built by them if assured of priorities on materials.

JUNE 12.—Senate Judiciary Committee opened hearings on three Gillette Bills to divorce major companies from ownership of pipe line and marketing facilities.

JUNE 16.—House passed the Bland Bill raising load lines on tankers to increase capacity.

JUNE 19.—Coordinator Ickes and his staff held general conference with the oil industry and announced organization and procedures of the OPC.

JUNE 27.—Coordinator Ickes asked major oil companies to make no changes in relationships with distributors because of the threatened shortage of gasoline in the East.

JULY 11.—Coordinator Ickes appointed a General Industry Committee and 20 regional committees in 5 districts to work with the Office of Petroleum Coordinator.

JULY 18.—Ickes asked motorists in 18 Atlantic seaboard states to reduce gasoline consumption by one-third, and hinted at compulsory rationing.

JULY 22.—Cole Pipe Line bill sent to the president for signature and Mr. Ickes immediately asked for construction of a 24-in. pipe line from Texas to New York.

AUGUST 1.—Export of petroleum and products to Japan virtually prohibited.

AUGUST 4.—Representative Cole, at the request of President Roosevelt, introduced legislation to extend the interstate oil compact for another 2 years.

AUGUST 4.—Gasoline stations in eastern seaboard states ordered to close between 7 p.m. and 7 a.m.

AUGUST 7.—Four American tankers loaned to Russia.

AUGUST 10.—The OPM established complete priority control of all iron and steel products.

AUGUST 18.—Senator Maloney of Connecticut introduced resolution to investigate the oil shortage in eastern states.

AUGUST 23.—The OPC prohibited the use of blending agents in any except aviation gasoline.

AUGUST 23.—The OPC asked the oil industry not to drill unnecessary wells in proven fields.

AUGUST 28.—Senate committee, headed by Senator Maloney, began hearing in investigation of eastern oil shortage.

SEPTEMBER 1.—President Roosevelt created the Supply Priorities and Allocation Board, and delegated sweeping power to the director of priorities of OPM.

SEPTEMBER 9.—Maloney committee heard conflicting testimony as to ability of railroad tank cars to transport sufficient petroleum to the eastern states.

SEPTEMBER 9.—SPAB refused to allot steel to construct proposed pipe line from Texas to New York.

SEPTEMBER 15.—Maloney committee reported that the shortage of petroleum in the East was only a shortage of surplus.

SEPTEMBER 26.—The Office of Price Administration heard Pennsylvania crude-oil producers protest against a ceiling order on their prices.

OCTOBER 3.—Coordinator Ickes attacked his critics at renewed Maloney committee hearing.

OCTOBER 10.—Oil industry given automatic priority rating on material for maintenance and repair.

OCTOBER 10.—Price Administrator Henderson began a study of crude-oil prices in the Mid-Continent area.

OCTOBER 20.—OPC began program to triple the nation's capacity to produce 100-octane gasoline.

OCTOBER 24.—Coordinator Ickes lifted all restrictions on sale of gasoline in eastern states on being informed that the British would return 25 American tankers loaned to them.

NOVEMBER 7.—SPAB announced a plan to allocate scarce materials to various industries.

NOVEMBER 18.—State Department announced signing of an agreement with Mexico providing a plan for settlement of the controversy over expropriation of American owned oil properties in Mexico.

NOVEMBER 29.—Coordinator Ickes appointed a 66-member Petroleum Industry Council for National Defense.

NOVEMBER 29.—Price Administrator Henderson issued a statement clarifying his earlier actions in freezing prices of crude petroleum and petroleum products.

DECEMBER 5.—Tariff commission began a study of petroleum prices at the request of OPA.

DECEMBER 7.—Japan began war on the United States by bombing Hawaii.

DECEMBER 8.—Congress declared that a state of war existed with Japan.

DECEMBER 8.—The Petroleum Industry Council held its first meeting and began mobilizing the oil industry for war.

DECEMBER 11.—Through an OPC recommendation, the Government took complete control of the aviation-gasoline industry.

DECEMBER 11.—A plan for conservation and regulation of oil production in California was promulgated by Coordinator Ickes.

DECEMBER 23.—The OPM, in Conservation Order M-68, prohibited the use of steel and other materials in drilling and producing crude oil except as the wells comply with regulation of the OPC.

DECEMBER 23.—OPC promulgated a national proration plan specifying daily production of petroleum for each producing state on a monthly basis.

DECEMBER 23.—Department of Justice obtained a decree under the Elkins Act against all important interstate pipe lines limiting payment of dividends to users.

DECEMBER 26.—Drastic tire-rationing plan began.

Changes in Crude-Oil Prices During 1941

Details on variations in crude postings showing the companies which purchase in the various producing areas are published normally in the first issue of each month.

CALIFORNIA CRUDE-OIL PRICES

(Posted by Standard Oil Co. of California)

Gravity—	Signal Hill, Long Beach			El Segundo			Wilmington			Huntington Beach			Inglewood		
	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23
14-14.9	$.65	....	....	$.65	....	....	$.60	$.63	$.68	$.63	$.65	$.71	$.64	....	....
15-15.9	.65	....	....	.65	....	....	.60	.64	.71	.63	.68	.75	.64	$.70	$.76
16-16.9	.65	....	....	.65	$.73	$.79	.60	.65	.74	.63	.70	.79	.64	.73	.79
17-17.9	.65	....	....	.65	.75	.82	.62	.68	.78	.63	.73	.82	.68	.76	.82
18-18.9	.65	$.74	$.80	.65	.77	.86	.64	.71	.82	.63	.75	.86	.71	.79	.85
19-19.9	.69	.78	.84	.69	.80	.90	.66	.75	.86	.67	.79	.89	.75	.82	.88
20-20.9	.73	.82	.88	.73	.84	.94	.73	.80	.90	.72	.83	.93	.79	.86	.92
21-21.9	.78	.86	.92	.78	.88	.98	.78	.85	.94	.76	.87	.96	.82	.89	.95
22-22.9	.82	.90	.96	.82	.91	1.02	.82	.89	.98	.81	.91	.99	.86	.92	.98
23-23.9	.86	.94	1.00	.86	.94	1.05	.86	.93	1.02	.85	.94	1.02	.89	.95	1.01
24-24.9	.90	.97	1.03	.90	.98	1.07	.90	.97	1.06	.90	.98	1.05	.93	.98	1.04
25-25.9	.95	1.01	1.07	.95	1.02	1.10	.95	1.02	1.09	.94	1.02	1.08	.96	1.01	1.07
26-26.9	.99	1.05	1.11	.99	1.05	1.12	.99	1.06	1.12	.99	1.05	1.11	1.00	1.04	1.10
27-27.9	1.03	1.09	1.15	1.03	1.08	1.15	1.03	1.10	1.15	1.03	1.09	1.14	1.04	1.08	1.14
28-28.9	1.07	1.13	1.18	1.07	1.11	1.18	1.07	1.14	1.18	1.07	1.12	1.17	1.07	1.11	1.17
29-29.9	1.10	1.16	1.20	1.10	....	....	1.10	1.17	1.21	1.11	1.15	1.20	1.10	1.14	1.20
30-30.9	1.14	1.20	1.23	1.14	....	....	1.14	1.21	1.24	1.15	1.19	1.23	1.14	1.17	1.22
31-31.9	....	....	....	....	....	....	....	....	....	....	....	....	1.17	1.20	1.24
32-32.9	....	....	....	....	....	....	....	....	....	....	....	....	1.20	....	....

Gravity—	Playa Del Rey			Olinda-Brea Canyon			Coalinga			Torrance			Richfield		
	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23
14-14.9	$.65	....	....	$.61	$.65	$.70	$.60	$.68	$.73	$.65	$.66	$.70	$.61	$.65	$.70
15-15.9	.65	....	....	.61	.65	.72	.60	.68	.73	.65	.67	.72	.61	.65	.71
16-16.9	.65	....	....	.61	.66	.75	.60	.68	.73	.65	.69	.74	.61	.66	.73
17-17.9	.65	....	....	.61	.68	.78	.60	.68	.73	.65	.70	.77	.61	.68	.76
18-18.9	.65	....	....	.65	.71	.81	.60	.68	.73	.68	.72	.80	.61	.71	.79
19-19.9	.70	....	....	.69	.75	.85	.61	.68	.75	.72	.75	.83	.61	.73	.82
20-20.9	.76	$.75	$.80	.74	.79	.88	.62	.70	.77	.75	.79	.86	.65	.76	.85
21-21.9	.81	.79	.84	.78	.82	.91	.66	.73	.80	.79	.84	.89	.69	.79	.89
22-22.9	.86	.82	.87	.82	.86	.95	.70	.77	.83	.82	.88	.93	.73	.83	.93
23-23.9	.92	....	....	.86	.89	.98	.74	.80	.86	.86	.93	.97	.78	.88	.98
24-24.9	.97	....	....	.90	.93	1.01	.78	.83	.89	.89	.97	1.01	.82	.92	1.02
25-25.9	1.02	f.o.b.	f.o.b.	.95	.97	1.04	.82	.86	.92	.93	1.00	1.05	.86	.96	1.06
26-26.9	1.08	pipe	pipe	.99	1.01	1.08	....	.82	.95	.96	1.03	1.09	.90	1.01	1.10
27-27.9	f.o.b.	line	line	1.03	1.04	1.11	....	.92	.98	1.00	1.07	1.13	.94	....	....
28-28.9	pipe	....	....	1.07	1.07	1.14	....	.95	1.00	1.03	1.10	1.17	.98	....	....
29-29.9	line	....	....	1.10	....	....	....	.97	1.02	1.06	....	....	1.02	....	....
30-30.9	....	....	....	1.14	....	....	....	1.00	1.04	1.09	....	....	....	....	....
31-31.9	....	....	....	1.17	....	....	....	1.02	1.06	....	....	....	....	....	....
32-32.9	....	....	....	1.20	....	....	....	1.05	1.09	....	....	....	....	....	....
33-33.9	....	....	....	....	....	....	....	1.07	1.11	....	....	....	....	....	....
34-34.9	....	....	....	....	....	....	....	1.10	1.13	....	....	....	....	....	....

Gravity—	Lost Hills			Santa Fe Springs			Kettleman Hills			Elk Hills, Buena Vista Hills, Lakeview area, Midway-Sunset			Mountain View		
	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23
14-14.9	$.60	$.68	$.73	....	....	....	....	....	....	$.60	$.68	$.73	....	....	....
15-15.9	.60	.68	.73	....	....	....	....	....	....	.60	.68	.73	....	....	....
16-16.9	.60	.68	.75	....	....	....	....	....	....	.60	.68	.73	....	....	....
17-17.9	.60	.72	.78	....	....	....	....	....	....	.60	.68	.75	....	....	....
18-18.9	.60	.75	.81	....	....	....	....	....	....	.60	.72	.78	....	....	....
19-19.9	.64	.78	.84	....	....	....	....	....	....	.64	.75	.81	$.60	$.68	$.73
20-20.9	.69	.81	.87	....	....	....	....	....	....	.69	.79	.85	.60	.70	.76
21-21.9	.74	.84	.90	$.63	....	....	....	....	....	.74	.84	.90	.64	.73	.79
22-22.9	.78	.87	.93	.63	....	....	....	....	....	.79	.88	.94	.68	.76	.83
23-23.9	.82	.90	.96	.67	....	....	....	....	....	.84	.93	.99	.71	.80	.87
24-24.9	.86	.93	.99	.72	....	....	....	....	....	.89	.97	1.03	.75	.84	.90
25-25.9	.90	.95	1.01	.77	....	....	....	....	....	.94	1.01	1.07	.79	.88	.94
26-26.9	.95	.98	1.04	.82	....	....	....	....	....	.99	1.06	1.11	.83	.91	.97
27-27.9	.99	1.01	1.07	.87	....	$1.04	....	....	....	1.04	1.10	1.15	.87	.95	1.01
28-28.9	1.03	1.04	1.10	.91	$1.01	1.08	....	....	....	1.09	1.14	1.19	.91	.99	1.04
29-29.9	1.07	1.06	1.13	.96	1.05	1.12	....	....	....	1.14	1.19	1.24	.95	1.02	1.07
30-30.9	1.11	1.09	1.16	1.01	1.09	1.15	....	....	....	1.19	1.23	1.28	.99	1.05	1.10
31-31.9	....	....	....	1.05	1.13	1.19	....	....	....	1.24	....	....	1.02	1.09	1.14
32-32.9	....	....	....	1.09	1.17	1.23	....	....	....	1.29	....	....	1.06	1.12	1.17
33-33.9	....	....	....	1.14	1.21	1.26	$1.12	....	....	1.34	....	....	1.10	....	....
34-34.9	....	....	....	1.19	1.25	1.30	1.17	....	....	....	....	....	1.14	....	....
35-35.9	....	....	....	1.23	....	....	1.21	$1.19	$1.23	....	....	....	....	....	....
36-36.9	....	....	....	1.27	....	....	1.25	1.23	1.26	....	....	....	....	....	....
37-37.9	....	....	....	1.31	....	....	1.29	1.26	1.29	....	....	....	....	....	....
38-38.9	....	....	....	1.36	....	....	1.33	....	....	....	....	....	....	....	....
39-39.9	....	....	....	....	....	....	1.38	....	....	....	....	....	....	....	....

Gravity—	Athens-Rosecrans			Whittier, East Coyote (La Habra)			Montebello			Greeley, Canal, Wasco*			West Coyote Hills		
	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23	Jan. 1	Apr. 24	May 23
14-14.9	....	....	....	$.61	$.65	$.70	$.62	$.67	$.72	....	....	....	$.63	....	....
15-15.9	....	....	....	.61	.66	.72	.62	.67	.72	....	....	....	.63	....	....
16-16.9	....	....	....	.61	.68	.75	.62	.67	.72	....	....	....	.63	....	....
17-17.9	....	....	....	.61	.71	.78	.62	.67	.72	....	....	....	.63	....	....
18-18.9	....	....	....	.61	.74	.82	.62	.67	.74	....	....	....	.63	....	....
19-19.9	....	....	....	.65	.77	.85	.62	.68	.77	....	....	....	.63	....	....
20-20.9	....	....	....	.69	.81	.89	.62	.70	.80	....	....	....	.67	....	....
21-21.9	....	....	....	.73	.85	.92	.62	.74	.84	....	....	....	.72	....	....
22-22.9	....	....	....	.77	.89	.96	.66	.78	.87	....	....	....	.76	....	....
23-23.9	$.71	....	....	.82	.93	1.00	.71	.82	.91	....	....	....	.81	....	....
24-24.9	.77	....	....	.86	.97	1.03	.75	.86	.94	....	....	....	.85	$.93	$.99
25-25.9	.82	....	....	.90	1.01	1.07	.80	.90	.98	....	....	....	.89	.96	1.02
26-26.9	.88	....	....	.94	1.05	1.11	.84	.94	1.01	....	....	....	.94	1.00	1.06
27-27.9	.94	....	....	.98	1.09	1.15	.89	.98	1.05	$.83	....	....	.98	1.04	1.10
28-28.9	.99	....	....	....	....	....	.93	1.01	1.08	.86	....	....	1.02	1.07	1.13
29-29.9	1.04	$1.10	$1.17	....	....	....	.98	1.05	1.12	.90	....	....	1.06	1.11	1.17
30-30.9	1.09	1.15	1.21	....	....	....	1.02	1.08	1.15	.94	$.95	$1.01	1.10	1.15	1.21
31-31.9	1.14	1.19	1.25	....	....	....	1.07	1.12	1.19	.98	.99	1.04	1.14	1.18	1.24
32-32.9	1.19	1.24	1.29	....	....	....	1.11	1.16	1.23	1.02	1.02	1.07	1.18	1.22	1.28
33-33.9	1.24	1.28	1.32	....	....	....	1.15	1.20	1.27	1.06	1.05	1.10	1.22	....	....
34-34.9	1.29	1.32	1.36	....	....	....	1.20	1.25	1.31	1.10	1.09	1.13	1.26	....	....
35-35.9	1.34	....	....	....	....	....	1.24	1.30	1.35	1.14	1.12	1.16	....	....	....
36-36.9	1.39	....	....	....	....	....	1.28	1.34	1.39	1.18	1.16	1.19	....	....	....
37-37.9	1.44	....	....	....	....	....	1.33	1.39	1.43	1.22	1.19	1.22	....	....	....
38-38.9	1.49	....	....	....	....	....	1.37	1.43	1.47	1.25	1.22	1.25	....	....	....
39-39.9	1.54	....	....	....	....	....	1.42	1.47	1.51	1.29	....	....	....	....	....
40-40.9	1.59	....	....	....	....	....	†1.46	1.50	1.53	‡1.33	....	....	....	....	....

*Wasco not posted prior to March 12. Newhall, McKittrick, Kern River, Round Mountain, and Kern Front crudes were posted at 60 cents per barrel for all grades on January 1; this was advanced to 68 cents on April 24 and to 73 cents on May 23. †Montebello January 1 posting continued at 4 cent spread to $1.71 for 46-46.9°. ‡Greeley et al January 1 posting continued at 4-cent spread to $1.64 for 48-48.9°.

Seal Beach crude on January 1 posted at 64 cents for 14-14.9° to 21-21.9°; 22-22.9°, 69 cents; 5-cent spread to 24-24.9° at 80 cents; 6-cent spread to 27-27.9°; 5-cent spread to 30-30.9° at $1.12; April 24 posting, 23-23.9°, 77 cents; 24-24.9°, 83 cents; 25-25.9°, 88 cents; 26-26.9°, 94 cents; and 5-cent spread to 30-30.9° at $1.13; May 23 posting, 23-23.9°, 88 cents; 24-24.9°, 92 cents; then alternating in 5 and 4-cent differentials to 30-30.9° at $1.19. Wheeler Ridge crude on January 1 posted at 60 cents for 19-19.9° to 21-21.9°; 22-22.9°, 63 cents; then 4-cent spread to 75 cents for 25-25.9°; April 24 posted at 71 cents for 22-22.9° with 3 cent spread to 77 cents for 24-24.9°; May 23, 76 cents for 22-22.9°, 80 cents for 23-23.9°, and 83 cents for 24-24.9°. Coles Levee crude on January 1, 27-27.9°, 92 cents with alternating 3 and 4-cent spreads to $1.57 for 46-46.9°; April 24, $1.03 for 30-30.9° with 3 cent spread to $1.21 for 36-36.9°; May 23, $1.09 for 30-30.9° with 2 and 3-cent spreads to $1.25 for 36-36.9°. Elwood Terrace crude on January 1, $1.21 for 33-33.9° with 4-cent spreads to $1.37 for 37-37.9°; April 24 posted at $1.19 for 33-33.9°, $1.23 for 34-34.9° and $1.26 for 35-35.9°; May 23 posted at $1.22, $1.25 and $1.28 for these grades (all f.o.b. ship).

OKLAHOMA AND KANSAS

(Mid-Continent Grade)

Gravity—	Jan. 1	Apr. 1	May 20*
Below 21	$.70	$.75	$.85
21-21.9	.72	.77	.87
22-22.9	.74	.79	.89
23-23.9	.76	.81	.91
24-24.9	.78	.83	.93
25-25.9	.80	.85	.95
26-26.9	.82	.87	.97
27-27.9	.84	.89	.99
28-28.9	.86	.91	1.01
29-29.9	.88	.93	1.03
30-30.9	.90	.95	1.05
31-31.9	.92	.97	1.07
32-32.9	.94	.99	1.09
33-33.9	.96	1.01	1.11
34-34.9	.98	1.03	1.13
35-35.9	1.00	1.05	1.15
36-36.9	1.02	1.07	1.17
37-37.9	1.04	1.09	1.19
38-38.9	1.06	1.11	1.21
39-39.9	1.08	1.13	1.23
40 and over	1.10	1.15	1.25

*A few companies made their changes effective May 19.

Note: Some of the Oklahoma and Kansas gravity schedules start at below 25°, others at 25-25.9°, 28-28.9° and 30-30.9°, but carry the same differential and top price as shown in above table.

CARTER COUNTY, OKLAHOMA

Gravity—	Jan. 1	May 20*	Dec. 5†
20-20.9	$.60	$.70	$.75
21-21.9	.63	.73	.78
22-22.9	.66	.76	.81
23-23.9	.69	.79	.84
24-24.9	.72	.82	.87
25-25.9	.75	.85	.90
26-26.9	.78	.88	.93
27-27.9	.81	.91	.96
28-28.9	.84	.94	.99
29-29.9	.87	.97	1.02
30-30.9	.90	1.00	1.05
31-31.9	.92	1.02	1.07
32-32.9	.94	1.04	1.09
33-33.9	.96	1.06	1.11
34-34.9	.98	1.08	1.13
35-35.9	1.00	1.10	1.15
36-36.9	1.02	1.12	1.17
37-37.9	1.04	1.14	1.19
38-38.9	1.06	1.16	1.21
39-39.9	1.08	1.18	1.23
40 and over	1.10	1.20	1.25

*Some changes effective May 19.
†Scale starts at 75 cents below 21°.

CUMBERLAND FIELD, OKLAHOMA

	Jan. 10	May 20	Sept. 4
Cumberland, Okla.	$1.02	$1.12	$1.14

JACKSON AND TILLMAN COUNTIES, OKLAHOMA

Gravity—	Jan. 1	Apr. 1	May 20
Below 25	$.71	$.76	$.86
25-25.9	.73	.78	.88
26-26.9	.75	.80	.90
27-27.9	.77	.82	.92
28-28.9	.79	.84	.94
29-29.9	.81	.86	.96
30-30.9	.83	.88	.98
31-31.9	.85	.90	1.00
32-32.9	.87	.92	1.02
33-33.9	.89	.94	1.04
34-34.9	.91	.96	1.06
35-35.9	.93	.98	1.08
36-36.9	.95	1.00	1.10
37-37.9	.97	1.02	1.12
38-38.9	.99	1.04	1.14
39-39.9	1.01	1.06	1.16
40 and over	1.03	1.08	1.18

WEST TEXAS (EXCEPT PECOS COUNTY) AND LEA COUNTY, NEW MEXICO

Gravity—	Jan. 1	Mar. 29	May 21
Below 20	$.53	$.60	$.70
20-20.9	.55	.62	.72
21-21.9	.57	.64	.74
22-22.9	.59	.66	.76
23-23.9	.61	.68	.78
24-24.9	.63	.70	.80
25-25.9	.65	.72	.82
26-26.9	.67	.74	.84
27-27.9	.69	.76	.86
28-28.9	.71	.78	.88
29-29.9	.73	.80	.90
30-30.9	.75	.82	.92
31-31.9	.77	.84	.94
32 32.9	.79	.86	.96
33-33.9	.81	.88	.98
34-34.9	.83	.90	1.00
35-35.9	.85	.92	1.02
36-36.9	.87	.94	1.04
37-37.9	.89	.96	1.06
38-38.0	.91	.98	1.08

(Continued on Page 229)

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. . . the only drill pipe of its kind with tool joint ends die-forged from the pipe itself. Each length is rolled and forged from a single solid billet of special Blue Ribbon Alloy Steel.

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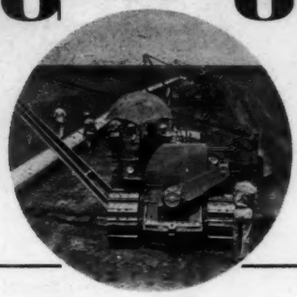


JANUARY 29, 1942

Plow-Type Equipment Useful In Pipe-Line Construction

By PAUL REED

The possibilities of plow-type equipment are being tested as the result of development work carried on by pipe-line construction men as well as by organizations of other industries. Although the use of these implements is still in the experimental stage, certain types have already demonstrated their value.

NEW types of implements which operate in breaking ground by utilizing plow-like features are being developed by certain pipe-line construction men. The extent to which they are employed is still somewhat limited. Some of them have definitely proved their value while others are still in the experimental stage. Because of their future possibilities they are gradually attracting increasing attention. In this group of plow-type devices are included rooters, rock rooters and pipe-line plows. While rooters do not resemble conventional plows they function by using elementary plow principles.

Plows have been widely used for some time for digging shallow ditches for small diameter lines. Within recent years special types of large plows have established their value in digging up old lines. Of particular interest this year are developments which have promise of influencing future practices for laying pipe of the diameters commonly used for laterals and trunk lines of crude-oil and gasoline pipe-line systems.

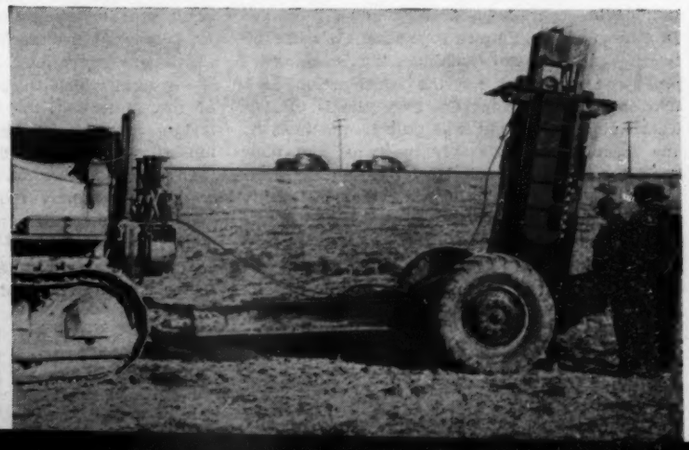
Under war conditions, ditching equipment which can be fabricated by welders at the pipe-line construction companys' shops may be found to be very desirable for meeting emergency situations. Ditching machines of the types made by leading manufacturers have been developed to operate efficiently under the variety of conditions which are met in the field. Experiments with plow-type equipment have been carried on largely to supplement and increase the effectiveness of ditching machines.

The first step in this direction was taken when Williams Brothers Corp. introduced the rooter into pipe lining in Wyoming during the laying of the Utah Oil & Refining Co.'s line in the summer of 1939. This rooter equipment had previously been used only for road construction. When operated for pipe-line work, a single prong tears up the ground to enable the ditcher, which follows, to dig faster. It will be noticed in an accompanying photograph of a rooter that two arms extend to the rear and upward which are intended for road building work but are not used in pipe lining. It can also be observed that, in designing this rooter, attention has been given to balancing weight in the rear to hold the rooter down so as to tear the ground at the desired depth under varying ground conditions. A heavy yoke supports a block for the cable that raises and lowers the rooting prong.

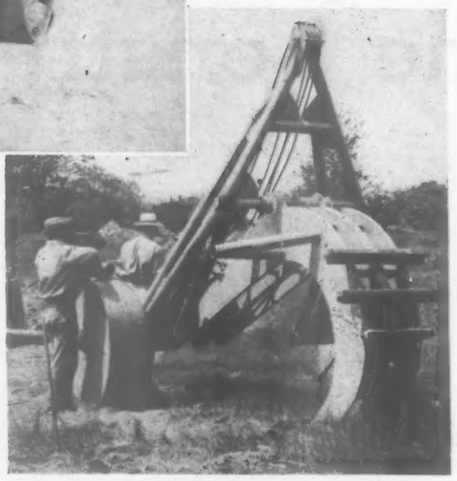
Although the rooter has proved to be valuable, particularly for tearing hard ground, it has not yet come into general use on pipe lines. The past year rooters were employed in the construction of the Portland-Montreal line in the section traversing New Hampshire, Vermont, and Canada as well as on the Plantation Pipe Line in the Georgia and Carolina sections. Some of the main features of the rooter have been incorporated in both the rock rooter and a pipe-line plow which were later developed.

For meeting the unusual conditions in the mountainous region crossed by the Portland-Montreal line where the ground contained large glacial boulders, Williams Brothers' organization developed a special type of rooter, known as the rock rooter which followed the rooter along the right-of-way and preceded the ditching machine. The rock rooter has three large hook-like prongs which can be raised and lowered in the ground by cables controlled by the operator of the tractor towing the rock rooter. On the rear side of the

Left: Plow digging up Kingwood-Cushing, Okla., line of Empire Pipe Line Co. Right: Plow equipment employed in laying the transcontinental telephone cable near Cherokee, Wyo.



Above: Special type of plow ditching for a 6-in. line of Pure Transportation Co. in southern Oklahoma. Left: Rooter breaking ground ahead of ditcher in Georgia during the building of the gasoline pipe line of Plantation Pipe Line Co.



Rock rooter used behind a rooter to remove rocks ahead of the ditcher on the northern end of the Portland-Montreal line

hook-like prongs there are three cross pieces against which a bulldozer can push. Those superintending the work reported that the rock rooter raised to the surface nearly all the boulders which it could get under. Because of this equipment it was possible to reduce substantially the amount of blasting required. The rooter and rock rooter reduced the burden on the ditching machine and back hoe.

In August, the Williams Brothers' organization went a step further in developing plow-type equipment when it tested a ditching plow in the construction of a 6-in. crude-oil line for Pure Transportation Co. in southern Oklahoma. This had been designed and built in the company shop. Facilities for raising and lowering the plow are similar to those adopted in building the rock rooter. This plow was of a double mold-board type which throws dirt to both sides of the ditch. This type is defined as a lister. At the time the writer saw it in operation, it was pulled by one tractor. A practice was followed of passing over the route three times in order to get a clean ditch at the desired depth. The plow was ditching at a rate which was sufficient for the requirements of the job at that time. However, work with the plow was frankly regarded as an experiment to determine the requirements which must be faced in designing equipment for this purpose. It was used only on a part of the line; most of the ditching was done with ditching machines.

Large plow equipment is most commonly used in pipe-line operations for digging up old lines. In taking up the Empire Pipe Line Co.'s line between Kingwood and Cushing, Okla., from which pipe was furnished for the construction of a line of Kaw Pipe Line Co. from Bemis to Ray, Kans., plow equipment was pulled sometimes by one tractor but preferably by two. The plow itself has a wide tip suitable for riding along the top of the pipe. Mold boards were sufficiently wide for throwing the dirt on either side of the ditch. A cable looped under the pipe was fastened to the end of the plow. This cable served the double purpose of holding the plow down and lifting the pipe somewhat before it was raised completely by a cradle carried along the line by a boom tractor.

Interest in plow-type equipment for pipe lines has been stimulated considerably by the unique methods adopted for laying the transcontinental cable by Bell telephone interests. During the time when this work has been going on for more than a year a number of pipe-line-company and construction-company executives have made a point of studying the methods employed because of the suggestions which might prove useful in pipe-line construction. The work is done by a train 275 ft. long consisting of nine pieces of equipment including diesel-powered tractors, rooter, plow and trailers. The cable is laid in one continuous operation. A narrow slit is cut in the ground which is about 30 in. deep for most of the route. At the bottom of this there is laid a pair of long-distance telephone cables, immediately backfilled behind the train. In order to avoid damaging oil and gas pipe lines, the telephone company requested maps as well as guidance by a company representative when cable-laying operations were approaching these lines.

The telephone company's tractor pulling the rooter is also connected by cable to the tractor which pulls the plow as well as the trailers with caterpillar treads on which the reels for holding the cable spools are mounted. The plow equipment bears no resemblance to anything that has been used in agriculture or pipe lining. The plow itself is sufficiently long to permit adjustment for digging as deep as 7 or 8 ft. if that becomes necessary. The plow blade is held in a housing mounted on a rubber-tired trailer with a fairly long drawbar connecting it to a tractor.

Those who have been concerned with designing plow-type equipment for ditching have become aware of the fact that, while the modern agricultural plow appears to be a simple and primitive tool, much mechanical skill and ingenuity have been expended in adapting it to its work. Pipe-line men are doing what has been found to be useful in agricultural plowing. The pipe-line rooter is functioning something like the colter on the agricultural plow since both of them tear the ground ahead of main excavating operation.

Solution of Plow Problems

In designing a plow which is to be towed by a tractor a special set of problems must be met. In order to hold the plow in the ground considerable weight is commonly used; this may be somewhat reduced by the manner in which the weight is distributed in order to get a desired balance. It would be desirable to reduce the weight still further in order to operate with less horsepower. In towing a heavy plow there is frequently a tendency for the front end of the tractor to rise when the plow strikes an obstruction. There are advantages in having heavy plows for pipe-line work towed by an angle dozer because of the beneficial effect of the weight of the equipment on the front end.

Recently provision has been made for correcting these difficulties in the design of a certain small type of tractor plow which, in its present form, cannot dig a ditch deeper than 20 in. However, there seems to be no reason why the principles involved could not be utilized in making larger equipment for deeper ditching. Solution of the problem has been accomplished by a flexible, three-point linkage and hydraulic control of a plow without wheels towed by a tractor. With this equipment, the weight of the plow is carried forward on the tractor. When an obstruction is hit, the effect of the forward position of the center of gravity means that the front wheels hug the ground. Resistance of the implement in the soil is utilized to provide additional traction for the tractor. Weight is not depended on to force the implement into the soil. Instead, the linkage is so designed that the implement is pulled into the soil by the forward motion of the tractor. Because the implement is pulled into the ground as the tractor moves forward a means of controlling the depth is required. This is accomplished by control of the hydraulic system. With hydraulic control, the implement is held at the depth at which it is set. The linkage mechanism acts as a safety device if the plow hits a rock, stump or other obstruction. When the obstruction is hit, the impact on a link causes the master valve to operate. This automatically decreases traction, instantly minimizing strain on the tractor and plowing equipment. The tractor and plow have been designed for working together with an efficiency which makes it possible to achieve substantial reduction of horsepower requirements.

The pioneering work which has been done by the foresight and initiative of pipe-line construction men opens the way for further developments which may increase the efficiency of ditching operations.

Record Number of Deep Tests Drilled During 1941

By HARRY F. SIMONS

WELLS drilled by rigs of drilling contractors and the oil-company drilling departments during 1941 not only approached the record number of completions but they also increased the total footage drilled over the previous year. During 1941 the 32,140 tests completed required the drilling of 98,531,892 ft. of hole, or slightly over 18,661 miles. This is an increase of 7,896,526 ft. or 1,426 miles over the 1940 total.

The trend toward deeper drilling not only resulted in the completion of 413 tests below 10,000 ft. but it also boosted to 3,065 ft. the average total depth of drilled wells. In 1940 the average was 3,043 ft. The 22-ft. jump in total depth is unusual as normally the average depth increases only slightly from year to year. In addition to the deep (beyond 10,000 ft.) prospecting, numerous tests were drilled to the lower horizons in areas already productive in shallower zones.

The 413 tests below 10,000 ft. represent an increase of 42 per cent over the 190 completions bottomed below that depth during 1940. Leader of all in the deep development work is the Louisiana Gulf Coast where 258 deep tests were completed; or 68 more 10,000-footers than were completed in the entire United States during the preceding year. Adding the 65 deep tests drilled in the Texas Gulf Coast area, it runs the total to 323 holes beyond 10,000 ft.

California Deep Work Declines

Deep work in California declined to some extent with the total for the year showing a decrease of nine tests drilled below 10,000 ft. During the first 3 months 31 deep wells were completed and then the work slacked off with a total for the year of only 84.

There were two deep completions in Northwest Texas, one in South Central Texas, and one each in Alabama, Mississippi and West Virginia. They were all dry although they gave important information which can be used as the basis for further deep prospecting in those areas.

The deep drilling work which was expected to develop as the result of work in the North and South Dakota area failed to materialize. The major test in that area failed to find production and work was suspended during the severe winter weather. It is expected that another attempt to find production in that area will be made next year.

A breakdown of the drilling depths into groups shows that there were 2,645 tests drilled to a depth of less than 1,000 ft., 12,172 tests bottomed between 1,000 and 2,500 ft., 12,381 completed between 2,500 and 5,000 ft., and 4,529 holes drilled to a point between 5,000 and 10,000 ft. This shows that by far the majority of wells drilled in the country are of medium depth and that even moderately deep drilling is secondary to it.

Deep drilling still is the proving ground for the newer and more advanced types of equipment and it is still the point on which most of the engineers are concentrating their skill. As advances come in this department they are adapted to shallower wells with a consequent reduction in drilling costs.

An examination of the accompanying table will show the areas in which an increase in drilling depth took place during 1941. It shows that in 15 of the 28 areas there was a decrease in the drilling depth while in 13 areas there were increases. However, the large number of wells drilled to deeper horizons in Louisiana, West Texas and Texas Gulf Coast more than offset these reductions.

TOTAL FOOTAGE AND AVERAGE DEPTH BY STATES IN 1941

		Wells	Total footage	Av. depth
Eastern	1941	6,290	12,211,786	1,941
	1940	5,821	12,668,498	2,176
Ohio	1941	1,653	3,354,370	2,029
	1940	1,227	2,109,786	1,719
Indiana	1941	513	980,586	1,911
	1940	504	900,648	1,787
Kentucky	1941	706	1,188,677	1,683
	1940	583	601,662	1,032
Michigan	1941	949	1,998,274	2,105
	1940	1,104	2,164,956	1,961
Illinois	1941	3,838	9,462,133	2,465
	1940	3,814	9,424,425	2,471
Mississippi	1941	282	1,406,305	4,986
	1940	210	1,018,967	4,852
Alabama	1941	9	20,045	2,227
	1940	11	39,061	3,551
Florida	1941	1	1,280	1,280
	1940	5	15,235	3,047
Georgia	1941	1	1,501	1,501
	1940	2	4,381	2,191
Kansas	1941	2,112	6,352,756	3,008
	1940	1,817	5,714,485	3,145
Nebraska	1941	94	212,923	2,265
	1940	64	141,824	2,216
Missouri, Iowa	1941	28	32,134	1,147
	1940	38	31,589	831
Oklahoma	1941	2,110	5,531,029	2,621
	1940	1,834	4,903,742	2,674
North Central Texas	1941	2,835	6,460,101	2,279
	1940	2,755	6,661,249	2,428
Eastern Texas	1941	1,058	4,435,098	4,192
	1940	621	2,432,891	3,918
West Texas	1941	2,297	9,724,986	4,234
	1940	1,855	7,553,810	4,072
Texas Panhandle	1941	718	2,142,850	2,984
	1940	560	1,677,860	2,996
Southwest Texas	1941	1,841	7,525,301	4,087
	1940	2,071	8,703,210	4,202
Texas Gulf Coast	1941	1,078	6,980,127	6,475
	1940	1,232	7,504,895	6,092
Louisiana Gulf Coast	1941	872	6,763,746	7,757
	1940	989	6,826,473	6,902
North Louisiana	1941	792	2,361,804	2,981
	1940	668	1,756,706	2,630
Arkansas	1941	198	911,418	4,603
	1940	179	1,001,736	5,596
Montana	1941	283	611,719	2,161
	1940	234	611,074	2,611
Wyoming	1941	161	496,223	3,082
	1940	179	583,468	3,259
Colorado, Utah	1941	33	100,671	3,050
	1940	22	86,995	3,955
New Mexico	1941	277	753,729	2,721
	1940	611	199,788	3,289
California	1941	1,111	6,510,550	5,860
	1940	1,030	6,130,099	5,952
Total	1941	32,140	98,531,892	3,065
	1940	30,060	90,635,268	3,043

Decline During Final Quarter

Part of the fluctuation was due to uncertainty during the first part of the year while a scarcity of material and men held up work during the latter months. Issuance of Order M-68 by the Government late in December had little effect on the footage drilled for that month as the wells completed during the last week of the year were already under way and were practically finished before that time.

Some of the slowdown during the last 3 months of the year was due mainly to realization by drilling contractors that a higher price per foot would be needed to meet the increased costs and that considerable difficulty might be experienced in getting necessary parts for their rigs. This latter consideration led to a policy of "take care of the equipment" rather than "get the hole dug."

Outstanding technological development during the year was the attempt in this country to drill with a turbine-driven rock bit. This was abandoned due to the press of war business. A turbo bit was tried out in the United States a number of years ago by a group of Russians and that country has recently claimed great success with it, although there is little information available on its design and performance.

Another development of interest was the introduction of an all-portable rig for drilling to 7,500 ft. This rig (including the derrick) is all wheel mounted and comes apart in three sections; the derrick is 120 ft. tall. The machine is in line with the trend of increasing the portability of all drilling equipment including that used for the deepest drilling.

The outlook for the ensuing year is clouded due to the large number of unusual factors which prevent any accurate prediction being made. Normally, the recent trends in activity and price could be used to gage a coming year's activity but this is far from being a normal year. Just what effect the 40-acre spacing order included in M-68 will have is still not known although it is evident that there is no tendency on the part of the Government to grant exceptions freely for development on less than the prescribed spacing.

To offset any decline in new work caused by the war situation, there will probably be a fairly broad program of reconditioning work which will keep many of the country's drilling rigs busy.

Increase in Oil Production by Application of Chemicals

By P. E. FITZGERALD
Dowell Incorporated

The petroleum industry is faced with maintaining the oil production of the nation in the face of a shortage of materials which will cause a curtailment of the drilling program. It has become increasingly apparent that the present fields must provide a major part of the oil needed for the required margin of safety. Production of many wells can be increased by an intelligent reconditioning program. The article deals with the use of chemicals and chemical treatments available for improving producing conditions.

THE demands to be made of the petroleum industry the coming months will require the cooperation of all branches of the industry itself as well as the numerous organizations associated with it. Large amounts of oil must be produced daily, readily available stocks of crude and refined products must be maintained and new reserves uncovered by vigorous exploration.[1] All of this must be done in the face of a shortage of materials that even now is making itself felt in the curtailing of normal drilling operations.

The object of this paper is to discuss briefly the place of chemical treatments of wells in the industry's program to secure the objectives mentioned above. First, however, it may be worth while to review the present position of the oil and gas industry and the relationship of these factors which control the security of the industry.

It has been pointed out previously that the United States and her Allies control more than 80 per cent of the world's crude oil reserves and nearly 90 per cent of its refining capacity.[2] The war effort of the United States will require approximately 150,000,000 bbl. in 1942 in addition to the domestic demand which is estimated to be only slightly in excess of 1941. This means that in order for the petroleum industry to satisfy the military, domestic and allied demand it must produce about three times the total demand of the Axis powers. The present production is slightly in excess of 4,000,000 bbl. per day and if the expected demands are realized the daily production will be of the order of 4,300,000 bbl. The industry can do this but the present wells should be operated efficiently so as to avoid physical waste and many new wells will have to be drilled to maintain reserves. All of this must be done with the least possible amount of steel. The ratio of oil discovered and produced to steel tonnage required should be held as low as possible. This point was well made by Gen. Walter B. Pyron in a talk before the American Petroleum Institute in San Francisco recently when he said a 136-ft. steel derrick contains enough metal to build a medium-size tank and 1,000 ft. of 7-in. 20-lb. casing enough for ten 27-mm. antitank guns.

For several years it has been known that the rate of finding oil has not kept pace with production and during 1941 the demand for crude has exceeded production, a condition causing the withdrawal of much oil from storage.

Discoveries Not Rapid Enough

Fig. 1 shows the amount of oil discovered during recent years and Fig. 2 illustrates the relationship between crude-oil production, crude stocks and domestic demand during 1941.

The first of these charts is prepared from data published by Pratt.[3] In order to smooth out the curve and to take into consideration the time usually required between the start of a drilling program and its completion the data are arranged in 3-year periods, each of which includes the last 2 years of the preceding period.[4] This curve shows definitely that the present prospecting methods are not resulting in a sufficiently rapid discovery of oil and suggests the need for new ideas in the technique of finding oil.

The only remedy proposed so far for the improvement of the reserve picture is an increase in crude prices. There is no doubt that a price advance will stimulate drilling activity to be followed normally by increased production, more crude stocks and greater reserves. However Pratt[3] has pointed out that there may be a several years lag between a price raise and the discovery of impressive amounts of oil.

He also makes it quite plain that the cost of finding oil has increased greatly during the last decade. This condition may be explained, in part, by the fact that more dry holes are being drilled per major discovery, due, no doubt, to the exploration of poorer geological prospects than has been the case in previous years. Another factor that has become increasingly important recently is the shortage of materials which will have a direct bearing on oil discovery.

Increase From Present Wells

It becomes increasingly apparent that the present fields must provide a major part of the oil needed to maintain the required margin of safety for some time to come. Also, it is not unlikely that certain fields will have to produce substantially more oil than at any one time in the past because of the need for specific types of oil; for example, those producing high-octane gasoline and those desirable from the standpoint of lubricating-oil manufacture. Other fields producing oil and gas from which synthetic rubber, toluene, and various chemicals can be manufactured may be required to step up their production considerably.

There are several fields, especially in Texas, Louisiana and Kansas, that can be made to produce more oil by the simple expedient of relaxing proration regulations, but these fields should be produced in accordance with good engineering practices, so that recovery of oil from them will be unimpaired. Other fields still in the flush or flowing stage will produce substantially greater amounts of oil for a limited time following which they will require pumping equipment or other

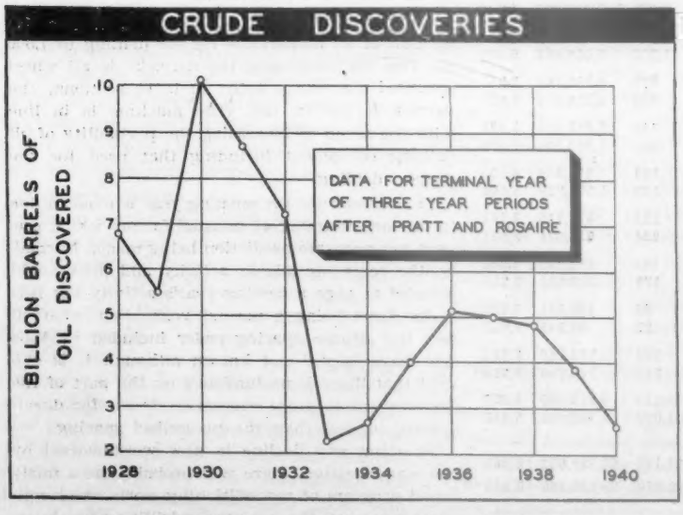


Fig. 1—Chart showing oil discovered from 1928 to 1940

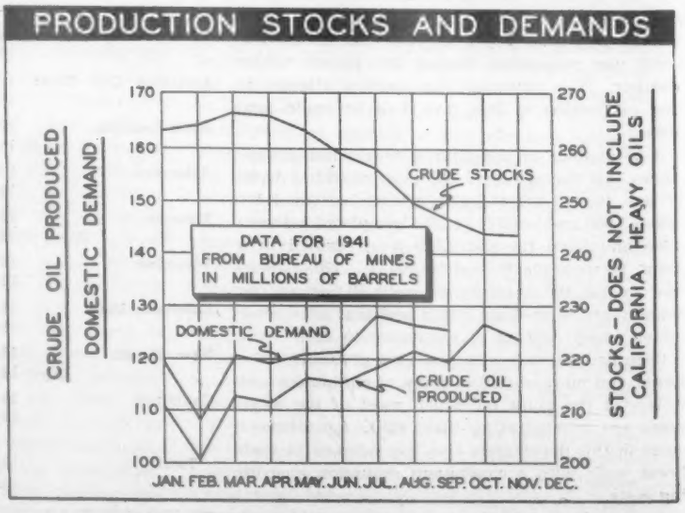


Fig. 2—Chart illustrating relationship between production, stocks and demands

mechanical methods of lifting the oil to the surface thus raising production costs.

Large numbers of the wells must be reconditioned before increasing their production above their present rate. The workover program may take numerous forms and must be decided upon by a careful study of the individual well, production history, geology and present conditions of the field.

In some the use of radioactive logs and subsequent gun perforation may result in the recovery of oil from zones passed up in the original completion of the well. Conventional cleanout methods may be of benefit in some wells and others will require tubing, casing, liners, screens and pumping equipment. In addition deepening, plugging back, various cementing techniques and the use of chemicals will have application in many areas.

Chemical reconditioning has been done for many years. As a matter of fact, the application of chemicals of various types to wells constitutes a form of reconditioning. Ordinarily they are not used unless there is a need to improve the production characteristics of the well.

Ever since inhibitors were used to prevent the acids from corroding the well parts with which they came in contact, the acidizing process has spread to nearly every part of the world where oil and gas occur in reservoirs composed of carbonate rocks. The use of certain chemical mixtures to alter the production characteristics of wells has since become an established progressive force in the oil industry. This is due largely to an energetic research program on the part of the chemical companies who fostered it and to the cooperative spirit of the petroleum industry which proved its worth.

Numerous Applications

Chemical treatments of wells may be made for various reasons using numerous mixtures in many different ways. The techniques and materials used must be based upon past experience and a thorough acquaintance with the field in general and the well in detail. No treatment should be undertaken until all the factors thought to govern the results of the application are evaluated and a decision made as to whether the well exhibits the characteristics that lend themselves to correction by the use of chemicals. The promiscuous dumping of various chemical mixtures into wells should never be permitted as this practice may not give the best results from the use of the materials.

As the use of inhibited acids in oil, gas and water wells became an accepted part of well completions and workovers it was accompanied by the rapid introduction of numerous addition agents,[4] treating techniques[5] and auxiliary tools designed to aid in the securing of optimum results from the use of the acidizing process. Most of these various items were made available to the acidizing industry following a careful study of the many factors thought to be contributing to the difficulties encountered in treating of wells. There is no doubt that they have been instrumental in aiding in the recovery of more oil[6,7] from properties near their economic limit and converting into profitable producers wells that otherwise would have been abandoned shortly after their completion.

A detailed description of most of the treating techniques, auxiliary materials and tools is available through previously published papers. Consequently, only a brief mention will be made here of the ones that may have the most universal application in the chemical reconditioning of wells.

Inhibitors to prevent acid corrosion have been an important adjunct in well treatment and are even more so now that well equipment is difficult to replace.

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for several years to facilitate uniform penetration of the acid into the formation and to assure easier, more complete and rapid removal of the spent-acid products. These agents have a definite application in formations of either low permeability, low pressure or both.

Agents capable of changing rates of reaction of acids on different types of formations are available. Some of these increase the rate of reaction on dolomitic and siliceous formations while others tend to reduce the reaction rate on fast reacting formations. The latter agents permit greater penetration of the acid before it becomes spent, an important factor in old wells where it is desirable to secure maximum penetration of the formation.

A large number of demulsifying compounds is available for use in wells where the acid or spent acid may form serious emulsions. The type of demulsifying agent used will depend on the type of oil and the emulsion formed as a result of the treatment.

Blankets and organic gel compounds to prohibit or minimize the downward movement of the treating compounds into water or an otherwise undesirable portion of the exposed formation are available. All of these are for temporary use and can be removed by normal production methods, no special cleanout operations being required.

There are also chemically inert, fragmented, flakey substances that are useful in preventing mud losses in drilling wells, regaining circulation losses in drilling and cementing operations. They also lend greater plugging properties to the organic gels used in temporary plugback operations and selective acidizing techniques.

Other Chemicals Used

Other chemicals often used are paraffin solvents[8] of many types, gyp or scale solvents and special acid compounds for the dispersion and disintegration of mud sheaths, infiltered water and similar deposits that may be causing a reduction of the flow of fluid through the critical area surrounding the well and the screen. The latter group includes the "mud acids"[9] which have been especially beneficial in wells on the Gulf Coast of Texas and Louisiana.

More recently "formation cleaner" treatments have been found to be quite successful in certain types of wells where hydrocarbon deposits are thought to be causing production difficulties. The chemicals used in these treatments do not depend upon an acid reaction and are, therefore, applicable to all types of formations.

Another group of chemicals that have an interesting application in some types of wells is certain inorganic gels[10] and special resins used for shutting off water and other undesirable fluids, to lower gas-oil ratios, water-oil ratios[11] and to save casing in some cable-tool drilling wells.

As the acidizing of wells expanded various special tools were designed and built to aid in certain well treating techniques. These tools include the jet gun[12] and the electric pilot. The former combines high-velocity eroding action with solution to permit more efficient chemical treatment of wells with wide variation in permeability and the latter is an apparatus that indicates the location of the interface between dissimilar fluids such as oil and acid or oil and salt water. When this tool is used in conjunction with a chemical treatment, it permits a better control of the treating materials, thus allowing for a more efficient use of the chemicals.

There are numerous methods by which the judicious use of chemicals can be of material benefit. In many fields producing from formations susceptible to acid treatment it is quite probable that fewer wells, when properly treated, can be made to produce as much oil as would have been produced had the development been carried out in a normal manner. It is also quite

(Continued on Page 207)

Petroleum Is Plentiful Source of Raw Material for Chemicals

By LEWIS F. HATCH
University of Texas, Austin, Tex.

ALMOST without exception, the important chemical producers are those whose operations are based upon the utilization of the cheap and plentiful raw materials—air, coal, and water. One might add to this list of cheap and plentiful raw materials—lime, salt and sulfur—but not cellulose, which is plentiful but not inexpensive. When we admit the conversion of cheap and plentiful raw materials to be the criterion for the establishment and expansion of profitable chemical operations, petroleum appears to be a basic material of vast possibilities to the industry. Petroleum has too long been looked upon solely as fuel for the supply of heat and energy while little or no thought has been given to it by the public as a chemical raw material of great potentiality.

Petroleum as a source of raw material has the advantages of abundance, low cost, wide distribution, ease of transportation, and a composition receptive to an ever-widening variety of reactions. The most important hydrocarbons for chemical conversions so far have been the lighter ones up to the octanes. The technical literature of refining has been increasingly concerned in recent years with the production of these various individual hydrocarbons by specific and clearly defined physical processes or chemical reactions. This typifies an important trend within the industry which is enlarging the field of petroleum utility and at the same time represents a change in the method of approach in refining processes generally.

Important chemical production is based on the utilization of cheap and plentiful raw materials and petroleum appears to be the basis for establishment and expansion of a new industry which will supply business and consumer with a wide range of products. This article deals with use of many of the new compounds being made from petroleum. The material in the article was first presented before the meeting of the American Association for the Advancement of Science at Dallas, Tex., on December 30 and then was prepared for publication.

In 1922, when isopropyl alcohol was first manufactured on a commercial scale from propylene gas supplied by a petroleum refinery, the American synthetic organic industry entered, perhaps unwittingly at the time, into a new and profitable era—that of using refinery and natural gases as raw materials. Today a number of different reactions are used to change these saturated and unsaturated hydrocarbons into more useful compounds. The sulfuric acid absorption of olefins followed by hydrolysis and other reactions is still the most important means of producing a variety of alcohols, ketones, ethers and other products. Chlorination is used in the preparation of amyl alcohol and its derivatives from pentane. By the chlorohydrination or oxidation of ethylene, followed by other reactions, ethylene glycol and its derivatives are prepared. Recently an oil company has announced a process for making glycerol from propylene employing a special high-temperature chlorination step developed by them. Another company is nitrating low-molecular-weight paraffin hydrocarbons to produce nitroparaffins.

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The wide variety of compounds thus produced from petroleum appears in many industries. The largest users are the manufacturers of coating agents and allied products, synthetic resins, plastics and fibers and in printing inks, cosmetics, and medicinal preparations. They are also used in dewaxing of mineral oils and extraction of vegetable and animal materials. Methyl and isopropyl alcohols, because of their complete miscibility with water, are used extensively as a component of antifreeze solutions for automobile radiators. The alcohols and ketones furnish chemical raw material for the synthesis of a great many types of compounds including esters, chlorides, xanthates, fruit essences, perfumes, dyestuffs and wetting agents.

Space does not permit a detailed discussion of all the interesting developments within recent years which illustrate the close relationship between the petroleum industry and the chemical industry and their interdependence. In fact, it is often very difficult to tell where one leaves off and the other begins. There have been, however, several developments which will serve to illustrate the trend and will give us an intimation as to what to expect in the future.

Synthetic Glycerol From Propylene

Recently detailed reports were published pertaining to the preparation of synthetic glycerol from propylene through a series of reactions involving other raw materials no more expensive than chlorine and alkali. Some eminent chemical engineers have termed the development of this process the most significant chemical achievement since the fixation of atmospheric nitrogen by the Germans in 1915. But, be that as it may, the process coming at this time of renewed international conflict and involving as it does one of our basic explosive raw materials, it does present a striking likeness to Haber's great achievement of the first World War. Since the announcement came at a time of war and when the need for the explosive nitroglycerin was imperative, the general impression was that the synthetic glycerol process was developed as a wartime expedient. Actually the research leading to synthetic glycerol was started in 1936 and came as a natural outgrowth of an expanding demand for glycerol against its essentially nonexpandable production as the byproduct of the stable soap industry.

Glycerol in normal times has many uses other than as a raw material for explosives. It is used in innumerable industries with about one-half of the domestic consumption being used in the manufacture of alkyl resins, coating materials such as cellophane and parchment, tobacco, and explosives containing nitroglycerin. The alkyd resin and cellophane industries alone utilize about one-fourth of the normal consumption of glycerol and the use is expanding rapidly.

Of especial interest to the chemical industry is the number of chemicals now made available as byproducts and intermediates of the glycerol process. Among these is allyl chloride, a reactive, unsaturated chloride already used to make allyl alcohol, mustard oil, various soporifics, and the anesthetic cyclopropane. The esters of allyl alcohol are used in perfumes and resins. The mono and dichlorohydrins and epichlorohydrin have potential uses in solvents, plastics and pharmaceuticals.

The opportunity for synthetic glycerol appears to lie in its power not only to stabilize prices but also to guarantee a virtually inexhaustible potential supply of high-grade glycerol at a reasonable price. The realization of this fact will tend to stimulate industrial developments leading to new uses of glycerol. A further and perhaps equally desirable feature of the synthetic glycerol process lies in its capacity to provide a range of glycerol and allied derivatives more economically than hitherto available to industry.

Gas a Source of Chemicals

Companies directly associated with petroleum have not been the only ones to sense the potentialities of petroleum and natural gas as a source of chemical raw materials. One chemical company heretofore primarily interested in the production of solvents by fermentation has recently placed on the market nitroparaffins made by the action of nitric acid on the principal constituents of natural gas—methane, ethane, and propane. These nitroparaffins offer, to quote the company, "new worlds for chemical exploration."

The nitroparaffins are not just another group of interesting compounds, but they open an entirely new field of organic chemistry — a field which promises to rival the development of the coal-tar derivatives both in magnitude and scope. For chemical synthesis the four nitroparaffins now on the market have a potential range of usefulness unequaled by any other new group of organic chemicals. In some cases they provide better methods of manufacturing well-known compounds—chloropicrin and hydroxylamine for example—but the majority of the reactions yield entirely new compounds.

The range of the more important products which have already been made from nitroparaffins and their derivatives includes pharmaceuticals, dyestuffs, insecticides, rubber chemicals, photographic developers, textile chemicals, and resins. Over a thousand derivatives have been prepared. In addition to their use in synthesis, these new chemicals are being employed as solvents, emulsifiers, and stabilizers.

Because of the relative newness of nitroparaffins, it is difficult to make any accurate forecast of their greatest fields of usefulness. In fact their most important applications may still be undiscov-

(Continued on Page 205)

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Sufficient Butane Can Be Made Available for Synthetic Rubber

By W. L. NELSON

Most of the butadiene and butenes required for the production of synthetic rubber can be made in the same plants that are being built for 100-octane gasoline production—and in these plants the butadiene normally would have been a byproduct waste. About 7,000-13,000 bbl. per day of these materials may be required. Likewise, another primary constituent, styrene, is a byproduct of the distillation of coal tar. Perhaps 1,000-4,000 bbl. of styrene will suffice.

Two types of synthetic rubber, i.e., Buna S and Butyl rubber, appear to be most satisfactory, although synthetics of many types and exhibiting many different properties are possible. After complete development, the properties of these rubbers will probably be superior to those of natural rubber and the cost will not be much greater. It is probable that natural rubber will eventually be considered as a cheap inferior product.

THE lay public and even technical men are confused concerning the manufacture of so-called synthetic rubber. Although even rubber specialists cannot at this time state the exact type or types of synthetic rubber that will finally dominate, the cost of various rubbers, the time required to attain full-scale operation, or to what degree the synthetic rubbers will surpass natural rubber in performance characteristics, each of these questions can be answered in a general way and the public can understand the apparent confusion or possible delays that may occur.

To date scientists have not been able to duplicate natural rubber but they have developed various similar materials each of which partakes to some extent of the properties of natural rubber. Most of the commercially important synthetic rubbers excel natural rubber in one or several respects but they may be inferior in other respects. Natural rubber suffers from one serious fault; it is chemically active and hence it tends to rot, to oxidize when exposed to the air and sun leading to hardening and cracking, and it is not resistant to many chemicals and solvents such as petroleum oils. Some of the synthetic rubbers, i.e. butyl rubber and vistanex, are notably superior to natural rubber in these respects, and in the case of butyl rubber, most of the other properties of natural rubber are exceeded by those of the synthetic material. Suffice to say[1] that "In the light of achievements to date, we are justified in looking forward to the development of synthetics, each one of which will exceed natural rubber in certain specific properties (or for certain purposes); in the aggregate, therefore, these products will give us something superior to rubber as we know it today." Thus the public must not apply a particular synthetic rubber to every purpose which may heretofore have been served by natural rubber, but rather must utilize a number of synthetics in supplanting natural rubber.

Constitution of natural and synthetic rubbers.—The exact nature of the rubber molecule is not known but the general type of material is indicated in Fig. 1, and the figure will also serve as a basic skeleton for indicating the structure of most of the synthetics. For the benefit of rubber chemists and organic chemists it should be stated that the figure and reactions shown thereon are not specific but are only a generalization for the purpose of comparing natural and synthetic rubbers. In general rubber-like materials are composed of repeating units of material (isoprene is shown in Fig. 1), even to totals of 1,000-7,000 units, which may be long chains as indicated in Fig. 1, or probably arranged in other ways, perhaps as a chain of rings. By vulcanizing, some of the reactive double bonds (shown in bold face) connect with sulfur, and a crossbraced type of molecule is produced which has a far higher strength and hardness than pure rubber, as well as a superior resistance to chemical action, notably the hardening due to exposure to air. Hard rubber is rubber that has been vulcanized so thoroughly and completely with sulfur that it loses its elasticity, and is relatively unreactive to air or solvents because few reactive double bonds remain.

The synthesis indicated in Fig. 1, need not be followed directly in making synthetic rubbers; in fact chemists have found that a large number of materials may be used in place of the isoprene indicated here, and even monoolefins (isobutene, etc.) may be used in place of dienes (isoprene, butadiene, etc.). Even two or more different kinds of unsaturated chemicals may be used rather than a single chemical. All combinations are not, however, satisfactory, some being sticky liquids or semisolids, others lacking elasticity, others lacking strength, etc. At least 29 different commercial synthetic rubbers[2] have been investigated prior to 1940 and some of these are listed in Table 1. Most of the synthetics have a greater flexibility or resistance to repeated flexure than natural rubber and this is particularly true for butyl rubber.[1] Of the synthetics listed in Table 1, butyl rubber deserves special attention. This rub-

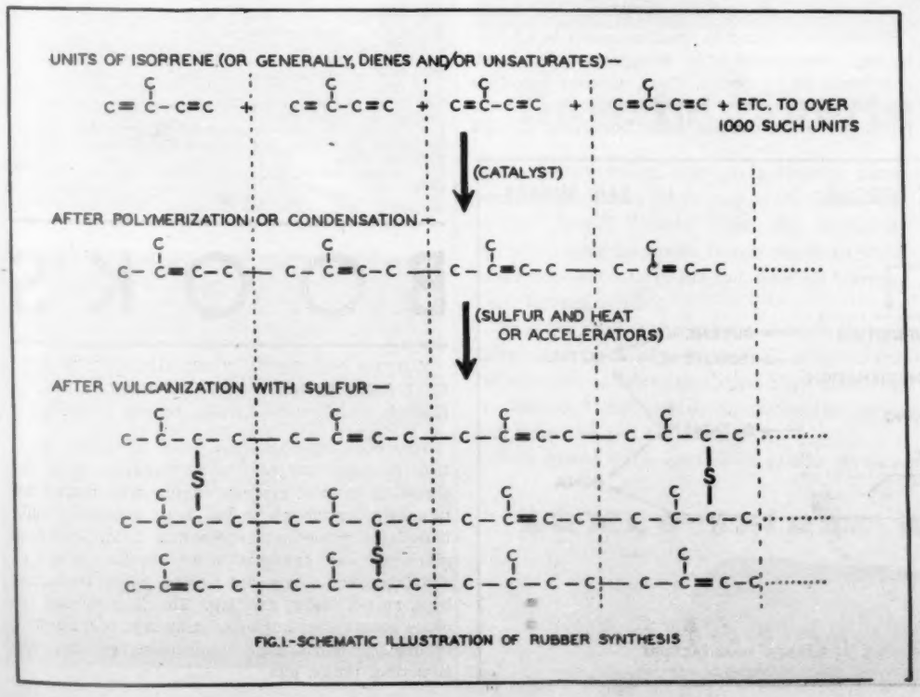

UNITS OF ISOPRENE (OR GENERALLY, DIENES AND/OR UNSATURATES)—
ETC. TO OVER 1000 SUCH UNITS
(CATALYST)
AFTER POLYMERIZATION OR CONDENSATION—
(SULFUR AND HEAT OR ACCELERATORS)
AFTER VULCANIZATION WITH SULFUR—

FIG. 1—SCHEMATIC ILLUSTRATION OF RUBBER SYNTHESIS

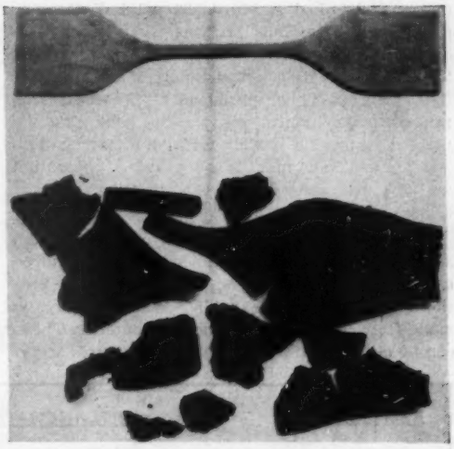
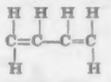
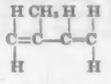
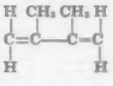
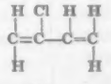
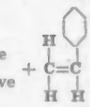
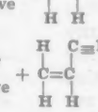


Fig. 2—Relative resistance of butyl rubber and natural rubber to concentrated sulfuric acid after 10-day immersion. Butyl rubber is shown at the top

TABLE 1.—A COMPARISON OF SOME SYNTHETIC RUBBERS

Commercial name—	Units of polymer: Name	Unit formula	Properties compared with natural rubber: Strength	Elongation	Chemical stability	Wear resistance
Buna 85, Buna 115, SKA, SKB, or Ker.	Butadiene 1,3		Fair	Good	Good	Excels
Natural rubber	Isoprene		Good	Good	Poor	Good
Methyl rubber	2,3 Dimethyl butadiene 1,3		Fair	Fair	.....	.....
Neoprene, Souprene, Mustone, or Duprene	Chloroprene		Good	Good	Excels	Excels
Vistanex, or Oppanol	Isobutene		Good	Good	Good	.....
Koroseal, Korogel or Flamenol	Vinyl chloride		Excels	Good	.....	.....
Buna S or Buna SS	Butadiene and styrene	See above + 	Good	Good	Good	Excels
Perbunan or Perbunan extra	Butadiene and acrylonitride	See above + 	Good	Good	Excels	Excels
Butyl (several)	Butadiene (or -dienes) and isobutene (or monoolefins)	See above	Excels	Good	Excels	Excels

ber contains scarcely any reactive double bonds in its molecule and hence it should and does exhibit extreme chemical stability. Fig. 2 indicates the great stability of butyl rubber when exposed to ozone (strong air). Latest press releases indicate that Buna S will constitute part if not most of the synthetic rubber produced in the 400,000-ton program now in progress. In the beginning the most of synthetic rubber will doubtless be high but after a few months or years of operation we have reason to expect that the cost will not exceed that of natural rubber.

Rubber raw stocks from petroleum.—Although small amounts of many chemicals will be required as accelerators, activators, fillers, catalysts, etc., the main bulk of the rubber will probably be made from butadiene, styrene, and butenes. These can be obtained in many ways as from coal, acetylene, alcohol, crude oil, and in fact any carbon-hydrogen source materials, but it will probably prove cheapest to utilize butanes from petroleum as the base stock for butenes and butadiene, and utilize coal tar for styrene. Styrene (B.P. 146°C.) may exist in large enough quantities in the xylene fraction (B.P. of 135°-150° C.) of coal tar to meet the need for 1,000-4,000 bbl. per day (depending upon what proportions of Buna rubber is produced), or it may be made by the reaction of benzol and ethylene at a red heat.

Butadiene Source

Butadiene is found in small amounts in all low-boiling decomposition or dehydrogenation products made in refineries. Thus, cracked gasolines and gases, particularly by high-temperature vapor-phase processes, contain some butadiene (1 to 5 per cent in some products) and in the production of isobutene for 100-octane aviation fuel. Thus, if say, 35,000-65,000 bbl. per day of isobutane is catalytically dehydrogenated or thermally decomposed into isobutene for the production of high-octane stocks by the alkylation, hydrocodimer or isooctane processes,[2-4] it may be possible by a slight change in operating conditions to produce a byproduct of butadiene amounting to the 3,000-8,000 bbl. per day that is required by the rubber program. The butadiene can be separated from the other products by a relatively simple washing process such as solution in cupric chloride. The petroleum industry is already familiar with the handling of cupric chloride (extremely corrosive) through use of the copper chloride sweetening process. Should it be possible to salvage both styrene and butadiene as byproducts of regular coal tar and butane dehydrogenation operations, the cost of synthetic rubber may very quickly be reduced to that of natural rubber.

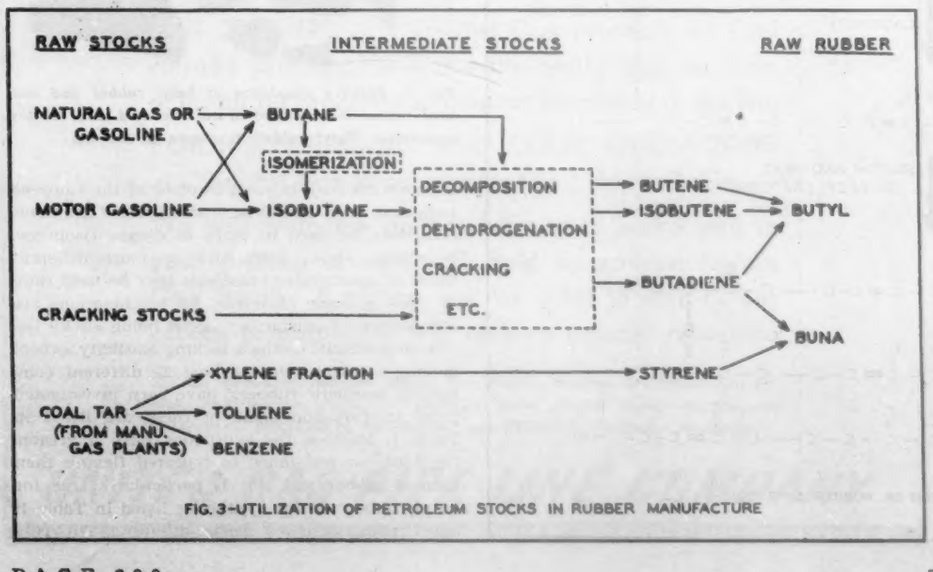


FIG. 3—UTILIZATION OF PETROLEUM STOCKS IN RUBBER MANUFACTURE

Butadiene From Butane

Should the production of butadiene as a by-product prove to be inadequate, the production could be approached directly by extensive dehydrogenation of butane.[5] In this process the butane is dehydrogenated by heating at 1,100-1,200°F. in the presence of a chromium oxide catalyst supported on alumina. Butene is produced in amounts of 60-75 per cent (10-20 per cent per pass) by recycling; and by long-continued heating or by repeating the operation on butenes, yields of 60-80 per cent (by recycling) of butadiene are produced. The over-all yield of butadiene from butane would thus be 36-60 per cent. The catalyst soon becomes dirty with carbon and must be cleaned by burning with air, but as many as 200 regenerations are said to be possible. Note that if butyl rubber is made (butadiene plus butenes), a suitable feedstock mixture might be produced in a single dehydrogenation operation, and the separation of pure butadiene and isobutene might not be necessary.

If butadiene and butenes are produced by the thermal or catalytic cracking of petroleum, large quantities of oil will be required but the figure of 200,000 bbl. per day mentioned in press releases would seem to be needlessly large.

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BOOKS

SIMPLE BLUE PRINT READING WITH SPECIAL REFERENCE TO WELDING. 2d ed. Lincoln Electric Co., Cleveland, Ohio, 146 pp. 50 cents.

This book is concisely written in simple, practical language for easy understanding. It is designed to aid and instruct anyone who must read blueprints, although it has been especially published for those in the welding field. The text gives a clear explanation of symbols used in drawing various types of welded joints, including butt, corner, fillet and lap. The illustrations include practical examples of drawings of a number of machine parts, pipe connections, general construction, tanks, etc.

SAFETY - Guard on Spinning Line Cathead

GENERALLY, accidents of a certain type follow a cycle. There is a period during which there is a rather frequent occurrence followed by an interval marked by comparatively few accidents.

This is mainly due to development of familiarity with danger on part of the crew and a relaxation of supervisory precautions which permits a dangerous condition to be present. After a series of accidents, the danger is impressed on both workmen and supervisor and a period of extra precaution and care in maintenance sets in.

Any moving piece of machinery is dangerous to some degree. Where a man has to work on or near it or performs work in conjunction with it, a certain hazard exists. The success of guards in reducing the industrial accident toll exposes this situation. For every dangerous point on the drilling rig, producing property or refinery, an adequate safeguard can be devised, which if properly maintained, will protect the workmen from injury.

The assumption that a piece of equipment will always function safely is in itself a hazard. Even safety devices have been known to fail and injure a workman when they were not properly maintained or operated, or some unforseen contingency arose.

It is often pointed out by members of the drilling crews that the cathead is the most dangerous part of a rig and it might be added that it is a continuous hazard and not an intermittent one.

Accompanying photographs illustrate an interesting case. The automatic spinning-line cathead on this rig is on the same shaft inside and adjoining the regular cathead. The spinning-line cathead was originally designed to eliminate a large portion of the danger of cathead operation as it operates in a positive manner when force is applied to the control lever. It is not necessary for a man to put a rope on the cathead or take a rope off of it.

The spinning-line cathead has prevented many accidents and it has been a success as its more frequent use in the field testifies. However, in the case shown above a man was injured due to an unfortunate set of circumstances. The accident occurred when the rope, being spooled on are spinning-line cathead (the inner one) piled up on the outer edge and finally jumped over on the regular cathead. When the driller released the clutch controlling the spinning-line cathead the line continued to spool on the regular cathead.

It is improbable that such an accident would happen again but steps were taken immediately to prevent any recurrence. The guard shown in the photograph below was designed and installed. It is made from sheet steel and fits over the automatic spinning-line cathead. The rope cannot possibly jump to the regular cathead as the guard keeps it on the spinning-line cathead no matter how badly it piles up. The same type of guards are being installed on all similar rigs owned by the company.

How to "Shorten" a Gas Line

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For speed with cost-savings use ARMCO "Spiral Welded" in fifty-foot lengths for that next pipe line. And be sure to specify the economical size and weight for your job. Diameters range from 6 inches O.D. to 36 inches I.D.; wall thicknesses from .140 inches to .500 inches, depending upon the diameter. Write us for prices and delivery promises. The American Rolling Mill Company, Pipe Sales Division, 141 Curtis Street, Middletown, Ohio; 501 Mayo Building, Tulsa, Oklahoma.

LINE PIPE AND CASING

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Prevention of Accident Needs Close Study of Causes

By D. A. KLEMME
Stanolind Oil & Gas Co.

YEARS ago, the petroleum industry recognized that accidents are *caused*, and included accident-prevention work as one of its operating problems. Study of accidents taught industry that just being careful was not even a good start nor did it eliminate the various types of causes that invariably kept coming to the attention of the management as accidents continued to occur.

Management of industry recognized the value of accident-prevention work and insisted that it be included in engineering problems. A definite and planned campaign was launched against unnecessary suffering and loss of life caused by accidents. The value of accident-prevention work has been accepted universally by the executive, the supervisor and the workman and only through their sincere interest and close cooperation will accidents continue to be eliminated and better accident records established.

The present war emergency places an added value on each worker in the petroleum industry as his replacement is becoming more difficult. In this article, the most common causes of accidents and the best methods of controlling these causes are discussed. About 85 per cent of the accidents involving petroleum workers can be traced to the human element as equipment or machinery failures are involved in only 15 per cent of the cases.

Only those points which are considered most important in reference to cause, analysis and prevention, will be discussed in this paper.

Accident causes are in direct proportion to the number of accidents that occur but in classifying these causes we find they can be placed under certain general headings, which are known as cause factors, as follows:

1. Inherent hazard.
2. Poor condition of equipment.
3. Unsafe tools.
4. Using too great an effort.
5. Poor housekeeping.
6. Failure to follow instructions.
7. Unsafe working practice.
8. Lack of individual alertness.
9. Physical fitness.
10. Poor design of equipment, safeguards, etc.
11. Insufficient knowledge of equipment.
12. Lack of proper supervision.

These cause factors seem to be few in comparison to the number and type of accidents that occur; therefore, the types of contributing causes under each of the factors are important.

Inherent hazards.—Accidents resulting from this cause are unavoidable and are very few in number.

Poor condition of equipment.—Regardless of the type of equipment being used, to neglect it means trouble and invites a cause for accidents. Conditions such as inefficient brakes on a vehicle or drilling rig, worn slings or chains, defective parts on machines, unsafe ladders, walks and floors, weak platforms, pressure vessels, and cables and many other like conditions as applied to equipment, are classed under this cause factor.

Unsafe tools.—Tools as a rule are kept in safe condition, but we do find hazards in tools, such as broken or cracked handles, burred heads on shock tools, dull wrench jaws, dull cutting tools

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and sprung or bent tools due to excess pressure or being misused.

Using too great an effort. — Causes under this factor are best explained by examples. For instance, a workman notices a joint of 4-in. pipe falling from a truck and rushes in to stop it from falling. The result is obvious. Lifting is another example: A workman loading material or lifting an object will test the load first to determine its weight. If he finds he can easily lift it without exerting his entire lifting strength, he can proceed without injury; but if the workman upon his test of the load finds it necessary to exert his entire lifting strength and then goes ahead with the lift without considering the hazard to himself, he is using too great an effort and is easily injured.

Poor housekeeping.—Contributory causes to this factor consist mainly of debris, presence of oil or other fluids that cause slipping hazards, materials or tools allowed to lie around under foot, poor or unsafe piling or stacking of material, unkept toilets and washrooms, and that old familiar rattlesnake—presence of protruding nails.

Failure to follow instructions.—This factor includes such causes as failure to report accidents; to properly use first aid on injuries; to follow any definite instructions or rules established relative to danger zones, work methods and personal protection.

Unsafe working practice. — Causes under this factor consist of violations of commonly accepted safe practices such as using the improper tool on a given job, a wrench for a hammer, a chain sling where wire rope should be used, taking a "short cut" or unnecessary hurry in doing a job, jumping on wrench handle to loosen tight joints, allowing wire lines to run through hands, wearing loose or improper clothes around moving machinery, riding moving machinery and, last but not least, "horseplay."

Lack of individual alertness. — Causes of accidents in this group rest entirely with the injured man. Everyone is familiar with the terms — his mind was in Arkansas; walking in his sleep; day dreaming; asleep at the switch, etc. These terms alone tell the story, but an example will give you a better picture. Workmen were driving a stake. One workman, in squatting position, holding the stake, another striking with a sledge. At the order, given by a third man, to stop striking, the man holding the stake, laid his hand over the top of the stake for assistance in rising. The striker, being well into his last swing, could not stop the sledge. The result? An amputated finger. The cause? Just pick out any one of the terms mentioned or say, "he just didn't think."

Physical fitness.—This is a cause that results in many accidents but is not always recognized. Being physically fit is the greatest asset any man can possess; therefore, it is a duty to himself, and one of which he can be justly proud, to keep his body healthy. Some of the physical causes showing the resultant cause for accidents or sickness are as follows:

Poor teeth, gums and tonsils: Weak back.
Excessive fat: Awkwardness and high blood pressure.
Poor eyesight: Poor judgment of distance; fatigue.
Constipation: Sluggishness; fatigue.
Nervousness: Irritable nature.

Poor design of equipment, safeguards, etc.—The contributory causes in this group have to do with the making of the machine or, for example, a machine left unguarded so as to expose danger zones, equipment such as scaffolds, ladders and platforms poor or of weak construction.

Insufficient knowledge of equipment. — Causes in this factor depend on the individual. He may not have understood instructions or when asked did not want to appear inexperienced relative to the operation of equipment. This results in a workman trying to do a job when he does not know the operating hazards involved.

Lack of proper supervision. — Supervision can be the cause of many accidents and has direct control of most of the cause factors mentioned. Therefore, when supervision is lacking, most any cause or condition may go unnoticed due to the following reasons:

A supervisor that is not entirely sold on safety will not have the proper interest, fails to give definite and clear instructions, does not lead his men toward safe thinking, accidents are not thoroughly analyzed and causes explained to his men, fails to properly plan the job and expects his men to assume the responsibility, passes up opportunities to point out unsafe practices to the men and fails to know his men and have their confidence. Anyone of these reasons may be the incubator for the development of a cause to a future accident; therefore, it is plain to see why the supervisor, with his ability in supervision, is referred to as the "key man."

Accident analysis is the medium used to take an accident apart and determine the ingredients, as most accidents do have a mixture of contributing causes. The first step to consider in analysis is facts of the accident and, to do a good job, all detail facts in the case should be reported. Second is the comparison of the facts to determine the contributing causes. Third, measuring the contributing causes to arrive at the basic or controlling cause factor. Having found the con-

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trolling factor, it is necessary to determine the person or persons to whom it belongs as responsibility in analysis of accidents is most important.

Other details are also essential as a matter of record, such as part of body injured, nature of injury, kind of work, type of equipment, time of occurrence, classification of injured person, age, experience and cost, all of which, when correlated, will produce evidence valuable in studying prevention measures and preparing reports. Accident reports should be concise and present an over-all picture of the accident experience.

There is still an important step not covered and that is, "Why did the accident occur?" Let's take the stake-driving accident. Facts: Three men were present, a supervisor and two workmen. It was very close to quitting time and the stake was being driven in a hurry. The holder of the stake was in a squatting position and remained there after the stake was started but was not particularly attentive to the actions of the striker. The striker was attentive to his striking job and the supervisor was watching the work and gave the order, "That's good," to the striker. Contributing causes: The supervisor gave his order to stop the striker after a swing was started. The holder heard the order but, not paying attention to the striker, assumed he had stopped swinging and immediately placed his hand directly in the danger zone, still not observing if the striker had actually stopped swinging. Controlling cause: The holder placing his hand in the danger zone at the opportune moment to cause the injury. Cause factor: Lack of individual alertness and the major responsibility rests with the injured man.

Prevention of accidents must start with the cause factor, and the person or persons responsible for the accident. Records on accident experiences show that only a small proportion, about 15 per cent, of the accidents are the result of equipment failure or inherent hazards, while the larger proportion, about 85 per cent, are the result of the cause factors that involve a man. Something a man did, or something he failed to do. If you will refer to the 12 cause factors under accident causes you will find that the responsibility in every factor, except inherent hazards, can be traced to a man. Engineering in accident prevention eliminates the faulty machine or equipment and results in operating methods being as safe as possible. However, how the machine, equipment and operating methods are used results in an accident setup being born.

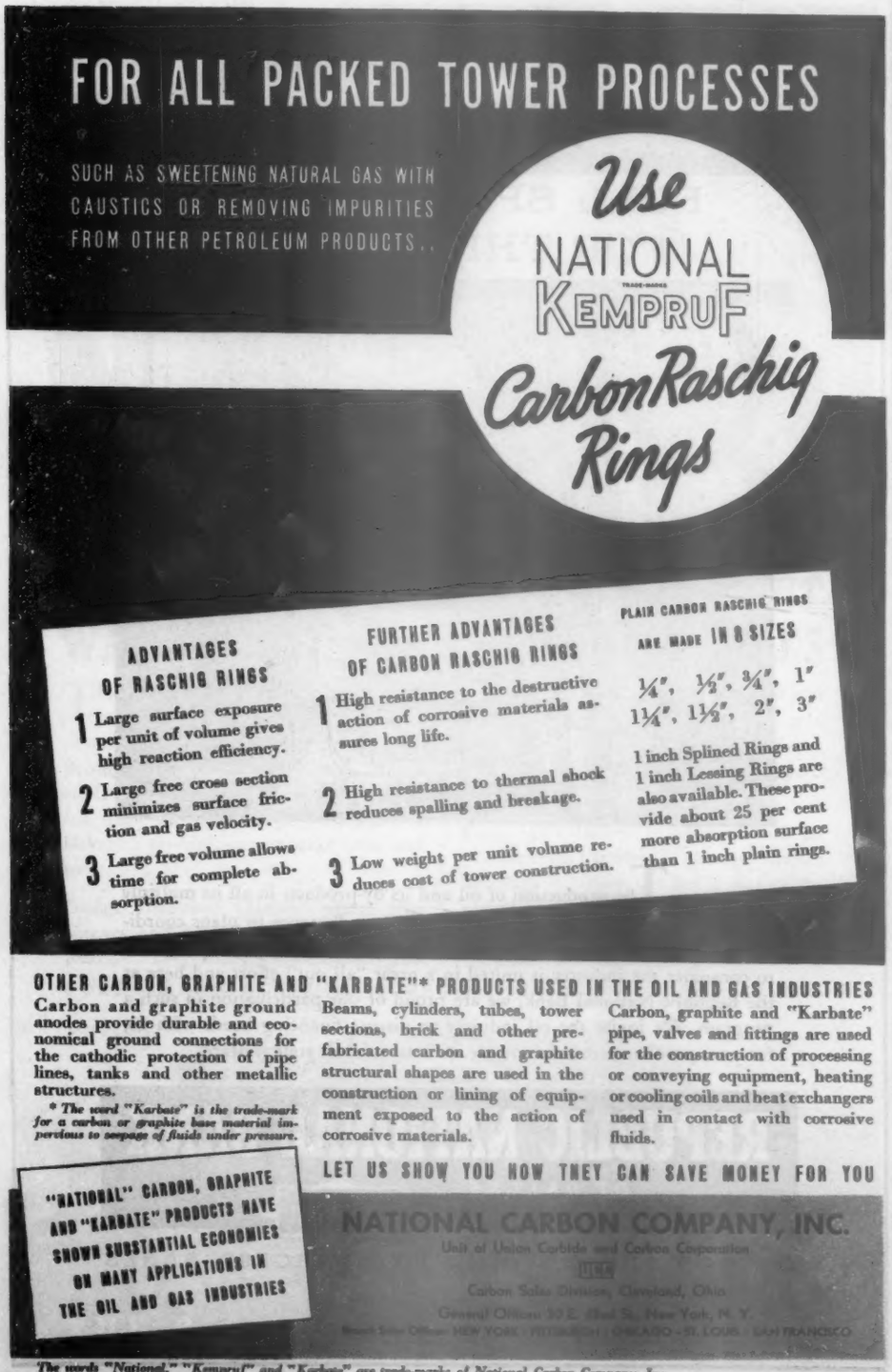
To accomplish the best results in safety education being carried to the man, we refer back to the "key man," or the supervisor. The supervisor must first be thoroughly sold on and interested in his responsibilities in preventing accidents. He must put forth an effort to educate himself in the various phases of his duties, absorb and study the information presented to him on prevention methods. Analyze his men by studying their characteristics and train of thought, further educate himself and secure educational information by his own complete analysis of accidents. If the supervisor has confidence in his men and they in turn believe in him, respect him and know he is vitally interested in their welfare, personal and group meeting contacts will produce the basic desired results. His men will be eager to improve themselves to show the supervisor that they, too, are vitally interested in his prevention program and consider themselves a part of it.

The workman has a responsibility in carrying out the teachings of his supervisor, applying such knowledge to his job, by constantly asking himself: "How can I be injured on this job? What must I do to eliminate an unsafe act? Is there an accident setup present, and how can I eliminate it? Is the wrench I'm using in safe repair? Am I applying it in a safe manner, and am I using a safe method in applying the pressure?" Such safe train of thought eliminates the following type of accidents:

A wrench, not properly sized, was placed on a hexagon nut. Pressure was applied by gripping the handle in both hands and pushing. When the wrench slipped, or the nut broke loose suddenly, a finger was mashed between the wrench handle and a pipe that was in direct line with the direction of force. If this man was applying safe train of thought, he would have seen the accident possibilities.

There is still another step to be considered in applying accident prevention and that is enforcement. Discipline is a necessary evil to forcibly bring the man, who is deliberately neglectful, to his senses. Most men can be made to see the value of prevention through education, but there are a few that let it go in one ear and out the other.

By hard work on the part of the supervisor, this type of man may be won over by constant personal contact; however, if this fails, there is only one alternative left, making disciplinary action necessary. The supervisor has a definite job in that he must make the man see his mistake by thoroughly explaining his neglectful act, thereby making the man realize that he himself made the mistake and deserves the penalty given. Accident prevention is a serious matter and must be considered a part of his job.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Petroleum Is Plentiful Source of Raw Material for Chemicals

(Continued from Page 198)

ered. The expanding production of new textile fibers, the expanding manufacture of synthetic rubber, the ever-widening application of plastics —all of these and many others require many new and highly specialized chemicals. Natural gas and nitric acid may combine to furnish many of these chemicals either directly or indirectly.

The contributions of the petroleum industry to the chemical industry have not been entirely in providing new and inexpensive organic chemicals. A number of inorganic chemicals are being produced as byproducts of the preparation of these organic chemicals. Some of the more recent and interesting are the hydroxylamine salts resulting from the acid hydrolysis of primary nitroparaffins. Hydroxylamine has been known for many years as a useful, reactive compound for chemical synthesis, but its application has been restricted by its high price and limited availability. The commercial production of hydroxylamine from nitroparaffins has stimulated interest in many new applications and in the reinvestigation of the many known uses of this chemical.

Ammonia a Byproduct

Still other inorganic chemicals have become available through a process of evolution. The production of ammonia by an oil company is an example. The oil company found that at one point on the process of preparing refinery gases for further utilization, it became necessary to remove a certain unsaturated hydrocarbon. The most efficient method to effect this removal was by its absorption in concentrated sulfuric acid. This acid absorption mixture was subsequently diluted with water and the olefin recovered as an alcohol of commercial importance. The resulting dilute sulfuric acid could not be reconcentrated economically. To utilize this dilute acid and also to utilize the hydrogen present in refinery gases, the company constructed a plant for the fixation of atmospheric nitrogen as ammonia. The ammonia to be used to neutralize the dilute acid with the formation ammonium sulfate—a compound widely used as a fertilizer.

The principal peacetime application of ammonia is not the making of nitric acid for explosive manufacture but in agriculture. When irrigation is practiced, farmers use liquid ammonia as a fertilizer by running the ammonia from cylinders directly into the irrigation water where it is carried into the soil as a highly dilute solution. In the form of ammonium sulfate it is used on land prior to irrigation, or on nonirrigated land. Ammonia has also other rather large peacetime uses such as its use by large cities in the purification of water, in oil refineries as a neutralizing agent and corrosion preventive, and in cold-storage and ice-manufacturing equipment as a refrigerant.

Before long the demand for ammonia and ammonium sulfate became so great that the supply of hydrogen had to be supplemented by the cracking of natural gas. This cracking of natural gas to produce more hydrogen to meet the demand for ammonia introduced the problem of utilization for the carbon formed simultaneously with the hydrogen. The problem was solved by collecting and processing the carbon to meet the requirements of the rubber industry. It has found wide acceptance as a soft carbon such as is used in the compounding of rubber for hose, tubing, gaskets, and mechanical goods. That part of the carbon not suitable for this trade was made into briquettes which, because of their very low ash content and nearly zero sulfur content, have been found useful in metallurgy, especially in steel production.

A company starting out to purify refinery gases is now furnishing alcohols and their derivatives for solvents to the chemical industry, chemical fertilizer to the farmer, ammonia to the ordnance manufacturers, and carbon to the rubber industry. It is also of interest to note that the sulfuric acid used can be produced by the petroleum industry—by the oxidation of hydrogen sulfide in refinery gas.

There have been given only a few illustrations of the possibilities of chemical products from petroleum. Among the many developments not touched upon are the wide variety of products from ethylene, such as ethyl alcohol, glycol and glycol ethers, and derivatives of acetylene, whose production from methane and other hydrocarbon gases has been shown to be feasible. It is reported that one chemical company is producing from olefins more than 100 products including 24 different alcohols, 4 ketones, 23 esters, 13 amines and 35 other chemicals.

The whole field of chemistry is extremely dynamic, but no branch of it today promises so much as the new petroleum chemistry. This progress in synthesis from petroleum hydrocarbons in recent years suggests that far-reaching effects are in prospect. An oil executive has looked to the future with these words: "Although prediction of future trends in the oil industry must be hazardous, there is no question but that the chemical manufacture will play an increasing important role. In some instances there actually may be a reversal of the original position, i.e., the refinery may be utilizing byproducts of the chemical factory, and not the factory the byproducts of the refinery. In any case a close relationship may be expected as the operations of both expand into new fields."

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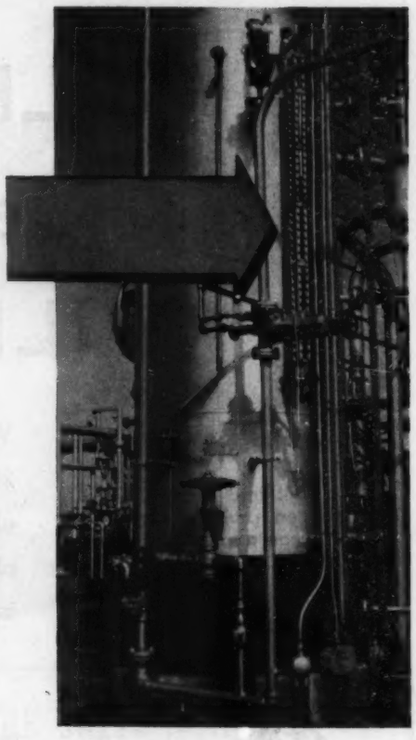

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New Liner-Cleaning Method Fills Need

By T. P. SANDERS

IN April 1941 the first trial of a new liner-cleaning method was made. A string of fuse-like explosive was hung through the liner of an old California well that had ceased to produce. After it had been detonated and many barrels of silt had been bailed out of the liner, the well was put on production at the rate of about 200 bbl. per day, of which only 10 per cent was water.

As is usually the case when a new idea is introduced in oil-field work, the liner-cleaning innovation has proved useful in an application even more interesting than the task for which it was intended. It has been found that liners which have defied attempts directed at their removal by ordinary methods can often be removed through the use of the explosive fuse. In this case the liner is engaged by a hollow fishing tool run on drill pipe, and a considerable pull exerted. The explosive fuse is run on a shooter's line through the drill pipe and into the liner, being weighted so that it will hang throughout the length of the liner. Having a rate of detonation of about 250 ft. per 1/100 of a second, the fuse imparts almost simultaneously an impulse to the walls of the liner throughout its length. This usually results in movement of the pipe which can be continued without further use of the explosive.

Cleaning Procedure

The explosive fuse, known to its users as the "cleaner," closely resembles the Cordeau-Bickford fuse long used in mining operations. It differs mainly in that it does not carry a lead jacket and its explosive core is smaller. Being flexible, it is easily handled and can be run over small pulleys at the well head. Its tensile strength permits hanging a weight at the bottom so that the "cleaner" can be lowered to the desired position under fluid in the liner. The fuse diameter is slightly less than the thickness of a lead pencil.

A detonator is installed at the top of the explosive fuse where the connection is made with the shooter's line. This is a rather small cap which is detonated by electricity from a switch at the surface. The detonator must be specially designed and manufactured to guard against premature discharge due to fluid pressures.

Experimentation was necessary to formulate general rules for the correct loading of wells. In most wells equipped with 5½ to 6⅝-in. liners, two strings of explosive fuse are detonated simultaneously side by side. In older wells, where liners are likely to be weak from corrosion, only one string of "cleaner" is used in order to avoid any possibility of splitting the liner. Other conditions influencing determination of the proper number of "cleaner" strings to use include: (1) size of slots or perforations; (2) number of slots or perforations per unit of area, and (3) whether the liner is made of welded or seamless pipe.

It is recommended that the well be cleaned out after detonation of the explosive fuse. Usually a large quantity of silt is found to have settled in the bottom of the liner, apparently having been dislodged by the impulse.

Success of this method of liner cleaning is believed to lie in the type of explosive used. Being a high-velocity explosive without appreciable volume, the fuse contributes a jarring "kick" with a practical absence of destructive "follow through." An electrical analogy can be seen in the gas-engine spark, where one finds high voltage without appreciable amperage as a close parallel to this instance in which work is accomplished by velocity without volume.

Tests above ground showed that the "cleaner" could remove one of the hardest known cements (litharge and glycerin) from the slots of a section of liner without injuring the pipe. After one such experiment no measurable enlargement could be noted in the slots, thereby indicating that the force generated within the liner remained below the elastic limit of the steel. After five such tests, however, an enlargement of the slots was disclosed by measurements. No apparent difference resulted from changes in the position of the fuse within the liner. This being the case, no attempt is made to center the fuse in the liner prior to

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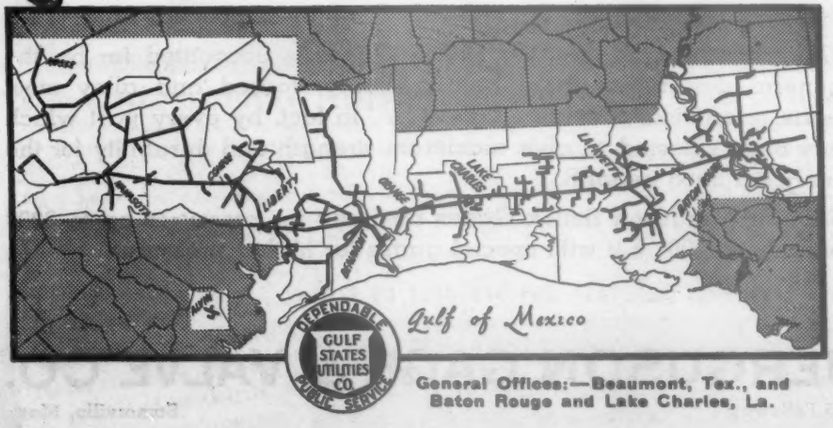

General Offices:—Beaumont, Tex., and Baton Rouge and Lake Charles, La.

detonation. The "cleaner" can be run in the well through tubing and detonated without pulling the tubing, provided that the tubing is above the top of the liner.

Three out of every four wells where the new cleaning method has been used have shown production increases following the work. While most of the wells were selected according to their chances for a favorable response, many were cleaned only as a last resort before abandonment. The high ratio of favorable results appears to be adequate support for the theory that practically all wells having liners are, at some period during their lives, restricted in production by clogging of the liner. This conclusion seems reasonable when it is remembered that all but a few liners are installed in wells loaded with heavy mud.

Examples of some of the more spectacular results obtained from liner cleaning include a case in which a well's production was increased from 75 to 285 bbl. per day, and another case in which an 8-bbl. well was turned into a 65-bbl. producer. The following case history will serve to show how the new process has been used to overcome well-completion trouble:

A well was being completed in a thick productive zone when the presence of an intermediate water zone was disclosed. A long liner was installed with a blank section opposite the water zone. Due to some kind of a failure or oversight which occurred when cement was being placed through perforations to occupy the space around the blank section, all slots throughout the length of the liner were cemented up. The explosion-fuse procedure was then applied, requiring two separate trips for the perforated sections above and below the blank section. Tests were then made to determine whether or not the detonations had disturbed the water shutoff at the blank section. No water was produced, and the oil production was sufficient to indicate that few if any of the slots opposite the oil zones remained closed by cement.

During the first 6 months after its introduction 100,000 ft. of "cleaner" was used in cleaning approximately 50,000 ft. of liner in California wells. One company recently cleaned one well per day for 11 days by this method. Present indications are that within a comparatively short time it will become standard practice in California to subject wells to this cleaning procedure as the final effort to avoid abandonment.

●

Increase in Oil Production by Application of Chemicals

(Continued from Page 196)

probable that throughout the United States there are thousands of wells wherein small amounts of chemicals can be used to a distinct advantage.

In anticipation of this statement a brief outline is given below to illustrate a few of the types of wells that may be altered favorably by chemical application.

1. Old wells neither deepened nor plugged back:
   - A. Wells never before treated.
   - B. Wells originally treated with small gallonage.
   - C. Wells with abnormal production decline.
     1. Productivity index lower than originally.
     2. Pores filled with silt, sediment, paraffin or gyp.
   - D. Wells with multiple pay zones where all zones have not been acidized.
   - E. Wells having abnormally low total recovery.
   - F. Wells in which original acid treatment was unsatisfactory.
     1. Results poor compared to offset wells.
     2. Formation didn't break.
     3. Pipe circulated.
        a. Leaky casing seat.
        b. Leaky packer.
     4. Mechanical difficulties on first treatment which have been corrected.
   - G. Input or disposal wells.
   - H. Gyp deposit on face of pay.
   - I. Wells injured during workover.
     1. Water on pay.
     2. Pay mudded off.
     3. Cement on pay.
2. Deepened wells.
   - A. Former horizon open.
   - B. Former horizon cased off.
3. Plugged-back wells.
   - A. Producing from open hole.
   - B. Producing through perforations.

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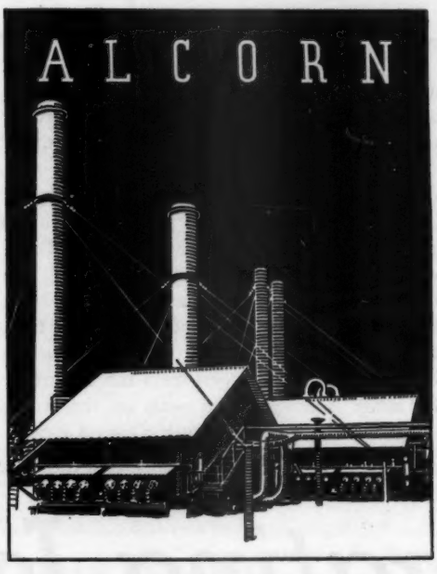

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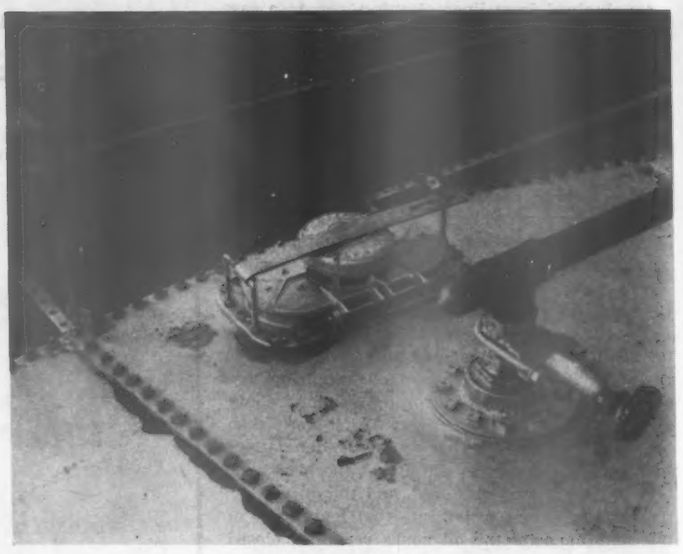
Lock Provided For Tank Hatch

Nearly everyone in the oil field knows that wells often produce a crude of sufficiently high gravity for use in an ordinary internal-combustion engine. This is particularly true around the Texas Gulf Coast where there are many distillate wells. On tank batteries located some distance from the office or lease worker's home it was found that thefts of distillate were quite common. Operators are installing locks on the tank hatches so as to prevent recurrence of the thefts. The tank battery also includes a vapor-conservation system so that it is never necessary to have the hatch open except for gaging purposes.



Operating Ideas

Extension For Flow Valve

Wells of one East Texas operator have most of the control connections below the ground level and would normally require that the switcher climb into the cellar to open and close the flow valve. By installing an A-frame with a wheel mounted on the cross member it is possible to operate the valve while standing erect. An old V-belt passes around the wheel on the valve and the wheel on the A-frame; it is kept in place by ears welded to the spokes of each wheel.

Tool House on Wheels For Servicing Unit

An oil company in Louisiana has put on wheels the tool houses used to carry the tools and equipment used with its well-servicing machines. The tool house is mounted on a trailer, the ridge pole of which is equipped for attachment to the pulling unit. In addition to the tool house, the trailer also carries the electric-generating plant which provides lights for the crews. Ample space is provided for tubing wrenches and tools on trailer bed.

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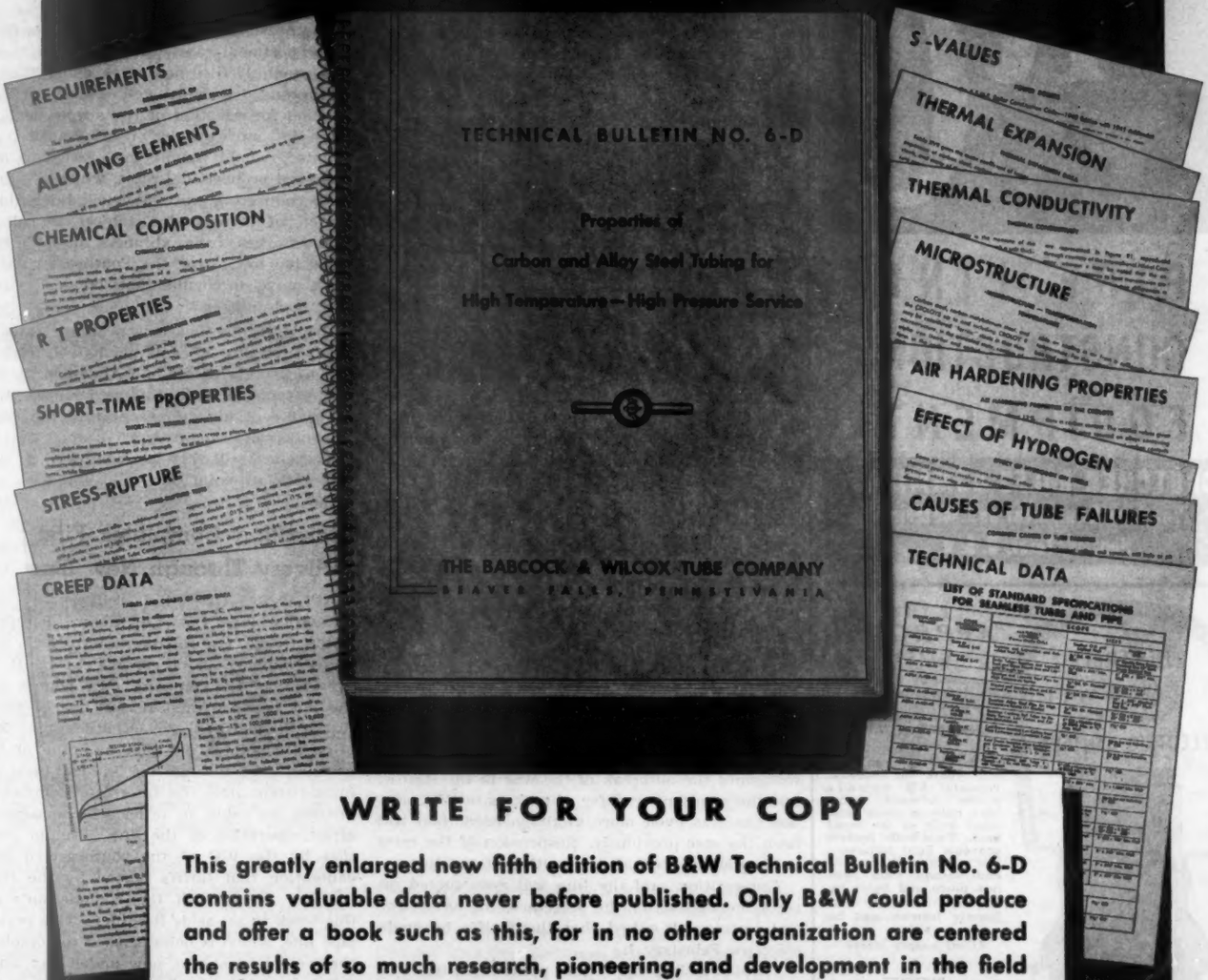

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THE OIL AND GAS JOURNAL

Pipe-Line Activity

Plantation Tariff-Suspension Order Lifted; Southeastern Plea Pending

WASHINGTON, D. C.—Suspension of tariffs proposed by the Plantation Pipe Line Co. for its new line from Baton Rouge, La., to Greensboro, N. C., was lifted late last week by the Interstate Commerce Commission.

The commission had ordered the rates suspended until August 15, 1942, pending an investigation into their legality. Plantation had proposed rates lower than those in effect on other pipe lines in the southeast.

The suspension and investigation order was issued after a strong protest was received from J. G. Kerr, chairman of the Southern Freight Association, who represented southern railroad interests.

Establishment of the low rates, Mr. Kerr charged, would give the proprietary petroleum companies owning the pipe line an "immense competitive advantage" over other producers in the sale of gasoline.

In addition, he contended that such rates would be "severely detrimental" to the interests of petroleum companies which ship from ports, as well as to those of the railroads serving these companies, and were not a necessary aid to national defense.

The Department of State Docks and Terminals for the State of Alabama, Mobile Chamber of Commerce, joined in the protest against the rates and requested that they be suspended.

Plantation submitted a petition to the commission on January 19, pointing out that the line was built under authority of the Cole Pipe Line Act, as a facility vital to the defense of this country, and requested that the suspension be lifted. In a supplementary petition, filed the following day, the pipe-line company pointed out that since the outbreak of the war in the Pacific, and the resultant transfer of tankers to that area, the line was even more vitally needed than had been the case previously. Suspension of the rates automatically precluded operation of the line.

The petition said the line was constructed on recommendations of the secretaries of navy, war and interior. It asked that the tariffs be made effective February 1.

"The principal aid," the petition stated, "of this pipe line to the national defense is the fact that it supplants tanker ship operations, and any necessary naval convoying from Gulf Coast to Atlantic ports in the southeastern states."

The company said that it was willing to have the tariffs investigated provided operation was permitted pending final decision by the ICC.

The very purpose of the legislation which forced the rails to grant rights-of-way to the lines was to make possible a means of avoiding in wartime the long water hauls around Florida and to provide supplemental transport to rail and truck.

The Plantation rates proposed ranged from 18 cents per barrel from Baton Rouge to Meridian, Miss., to 55 cents on shipments through to Greensboro, N. C.

Another unusual feature is that the protests were not received until 1 day from effective date of the rates, January 15, and hence ICC suspended without the pipe line having opportunity to file answer.

Similar plea by Southeastern Pipe Line Co. is pending before the commission as to its twice suspended proportionals. This petition should receive early action.

Southeastern Pipe Line Co., after its first group of proportional rates were suspended a fortnight ago, promptly filed new rates, and ICC as promptly suspended these as well. The line filed formal petition for vacation of the suspension, and ICC has the move under consideration. This, if granted, would permit the carrier to assess its proposed proportional rates, which are joint rates with connecting rail and truck lines, during the period of investigation subject to collection of undercharges from shippers if ICC finds the rates too low. Now the Southeastern shipments must move on combinations of local rates, which are much higher.

Originally Southeastern proposed rates ranging from 8 cents to 25 cents per barrel, from Port St. Joe to Georgia points and Anderson, S. C. When ICC suspended these, the carrier made the range ½ to 1 cent higher, except that the 8-cent rate to Anderson was made 25 cents.

These are still very low compared to rail rates. ICC officials point out.

Plantation Completes First Delivery Through New Line

ATLANTA, Ga.—First delivery by the new Plantation Pipe Line Co. system, running from Baton Rouge, La., to Greensboro, N. C., was completed January 23, according to C. R. Younts, president of the company. Mr. Younts said that the line had delivered 100,000 bbl. of gasoline to to the Standard Oil Co. (Kentucky) at Meridian, Miss. He pointed out that pumping of the first gasoline to go through the line had been resumed immediately after the Interstate Commerce Commission set aside an order which suspended, in effect, operation of the line. Prompt consideration by the ICC of the southeastern railroads' contention that tariffs posted by the line were too low resulted in the commission's decision this week to set aside its order. This permits the pipe line, which is being rushed to completion, to carry out its test run, now under way, and make deliveries to terminals along the line as the test is completed, section by section.

Mr. Younts said that testing of the entire main line will be completed within a month, and all 12 terminals between Baton Rouge and Greensboro will be receiving deliveries of gasoline and other refined petroleum products. Five other terminals, located on spurs of the line, will receive service shortly thereafter. These southeastern states, Mississippi, Alabama, Georgia, Tennessee, South Carolina, and North Carolina, will have an assured supply of petroleum products amounting to 25,000 bbl. a day when the test run is completed. A little later in the year, when additional pumping stations are placed in service, the line will deliver 60,000 bbl. a day, supplanting to a large degree tanker transportation subject to hazards of enemy action along the eastern seaboard.

Built at a cost of $20,000,000, the Plantation line was speeded to completion to provide rapid and safe transportation of gasoline to military and defense areas in the southeast.

"The construction of this line in so short a time is considered a major engineering feat," Mr.

Younts said, "and is believed to break all records for speed in pipe-line building. All told more than 120,000 tons of pipe will have been laid. The only pipe laying remaining to be done is along a few stretches of the lateral lines, totaling about 125 miles.

"An idea of the speed of this work may be gained from the fact that in one week in November, seven gangs of men welded 54.16 miles of 12-in. pipe. The peak of the work, from October 31 to November 14, saw 19 gangs of men welding pipe at various sections along the 1,261-mile route and 3,247 men at work. The line crosses 14 rivers, in addition to many creeks and small streams. On practically all these river crossings it was necessary to blast a ditch in the rock bottom of the river in order to lay the line. The line starts at sea level, and at Greensboro it is laid in land 920 ft. above sea level."

Plantation officials said that an idea of the line's size may be gathered from the fact that the completed line will hold more than 500,000 bbl. of gasoline.

Plantation's line, a common carrier, is owned jointly by the Shell Union Oil Corp., the Standard Oil Co. (Kentucky) and the Standard Oil Co. (New Jersey).

Pipe-Line Personalities . . . . . C. C. Bledsoe

C. C. BLEDSOE, secretary and treasurer, Midwestern Engineering & Construction Co., Tulsa, grew up and went to school at Mexico, Mo. In the 6 years following 2 years of study at Westminster College, his career was an unusual combination of work, mostly on pipe lines, and study for the bachelor of science degree in industrial engineering which he received at Oklahoma A. & M. College in July 1934 after taking courses in the spring of 1932, throughout 1933 and the first half of 1934. In pipe-line work as well as in college his close friends were Floyd E. Stanley and Theodore F. Hansen, with whom he is now associated in the Midwestern organization. In fact, at that time it was their hope that later they might be together in an engineering and contracting firm.

Mr. Bledsoe started pipe lining in January 1929 as ditch and paint inspector during the laying of the main line for Texas Empire Pipe Line Co.; later in the year he was connected with station construction at Center, Mo. The next year he was foremen during the laying of dock lines and assistant engineer during the construction of the cracking plant at which is now the Cities Service refinery at East Chicago, Ind. At this time he made intensive studies of labor costs and construction efficiency. During 1931 he was inspector of creek crossings and supervisor of installation of meter and regulator stations in Illinois for Natural Gas Pipeline Co. of America.

After receiving his engineering degree in July 1934 he joined the engineering department of Texas Pipe Line Co., at Tulsa, where his work included providing for cathodic protection, preparing appraisals required by ICC as well as engineering in connection with construction and operation. In August 1938 he resigned to join Floyd E. Stanley in organizing Midwestern Construction & Engineering Co., which has built extensive electric transmission systems as well as pipe lines for all types of service and other projects of various kinds.

Phillips Requests Highway Permits in Wisconsin

MADISON, Wis.—Indication that the Wisconsin Gas Transmission Co. intends to proceed under its certificate of convenience and necessity to pipe natural gas into Wisconsin was given here last week. J. O. Gibson, right-of-way representative of the Phillips Petroleum Co., parent of the Wisconsin firm and its sponsor, the Independent Natural Gas Co., filed a request with the Wisconsin State Highway Commission for permits necessary for crossing state trunk highways.

The company also will be required to comply with state specifications for tunneling under concrete roads.

Mr. Gibson showed the commission a tentative route for the proposed pipe line and said engineers for the company now are working on a definite route.

Two petitions for rehearing have been filed with the Wisconsin Public Service Commission on its order granting a certificate of convenience and necessity to the Wisconsin Gas Transmission Co. for extension of a natural-gas pipe line into the state.

One petition was filed by the Wisconsin Natural Gas Co., subsidiary of Western Natural Gas Co., a rival applicant; the other by Wiscinson Coal Bureau, Inc., representing coal and dock interests opposed to introduction of natural gas.

The Wisconsin Natural Gas petition maintained the commission order was unreasonable; that it failed to give correct weight to evidence submitted by Western Natural Gas or to the fact that Western was the first applicant; that the commission imposed conditions not authorized by law relating to revised rate schedules, and that it acted without authority in taking evidence on the economic effect of natural gas upon competing industries.

Construction Is Pushed for Lines in Kansas and Missouri

In the looping program of Stanolind Pipe Line Co. for providing additional capacity for the section of the trunk line between Washington, Kans., and Freeman, Mo., O. E. Dempsey Construction Co. completed 28½ miles of 12-in. It is expected that the remainder of the construction will be finished next month.

About 10 per cent has been completed on the 72 miles of 8-in. loops contracted by the Dempsey organization for enlarging the capacity of the Phillips Petroleum Co. gasoline trunk line in Missouri. This week the contractor's field office is being moved from Warrensburg to Sedalia, Mo. In laying the 53-mile 8-in. line for the Phillips system from Paola to Kansas City, Kans., approximately 5 per cent has been completed by this contractor.

Southern Pipe Line Supplies Gas for Saxet Field Operations

CORPUS CHRISTI, Tex.—Southern Pipe Line Corp. has placed in operation 19 miles of gas pipe line from the Agua Dulce field to the Saxet field at Corpus Christi, Tex. The line consists of 14 miles of 10¾-in. pipe and 5 miles of 8⅝-in. pipe, all 41-lb. material. It has a capacity of 50,000,000 cu. ft. of gas daily and operates at a pressure of 1,050 lb.

Gas for the line is purchased by Southern Minerals Corp. from the Agua Dulce Corp., which supplies it from the residue high-pressure gas of its distillate recovery plant in the Agua Dulce field. The line ties into Southern Minerals Corp.'s high-pressure gas system in the Saxet field supplying gas for lease operations in this field and for national defense industry, United States naval station and various civilian requirements in Corpus Christi and immediate area.

Preparations Are Made for Pipe-Line Construction

Plans have been made for receiving bids and letting contract early this week for the construction of 23 miles of 10-in. from Chase to the Wherry station in Rice County, Kansas, for the White Eagle Division of Socony-Vacuum Oil Co., Inc. It is reported that this will increase the capacity of the main line from Claflin, Kans., by 14,000 bbl., raising it from 66,000 to 80,000 bbl. per day. This line will be built to prepare for receiving additional deliveries which will be made on the completion of Kaw Pipe Line Co.'s looping program calling for 17 miles of 12-in., which is now under construction.

Arkansas Natural Gas Corp. has arranged for taking bids and letting contracts this week for the construction of a 136-mile line from Louisiana to Hot Springs, Ark.

The sinking of tankers by submarines along the Atlantic Coast makes it appear logical that steps will be taken to provide additional pipe-line facilities for supplying northeastern states. As yet no announcement has been made regarding a program for this purpose.

Construction Crew Prepares To Lay Venezuela Pipe Line

The last group of men for the construction of the Sinclair line in eastern Venezuela is being transported to the project this week where it will join the Williams Brothers Corp. organization which is handling the job. Work has been going ahead for the building of camp facilities and for preparations for laying the 100-mile 12-in. crude-oil line which will extend from the Santa Barbara area to a marine terminal near Puerto la Cruz. W. R. Reed, general superintendent, Sinclair Refining Co., pipe-line division, heads the party sent from Tulsa to handle construction matters. David R. Williams, vice president, Williams Brothers Corp., has been looking over the route. The contractor's operations will be supervised by A. M. Garber, superintendent. Guy S. Connors, general superintendent, Williams Brothers Corp., will make trips to the project while the work is in progress. The line will be laid for a subsidiary of Venezuela Petroleum Co., controlled by Sinclair interests.

Texas Pipe Line Completes Crude-Oil Line in Illinois

Texas Pipe Line Co. is pumping oil through the 34-mile 6-in. crude-oil line recently completed between Johnsonville and Rural Hill, Ill. As soon as conditions improve, the contractor, Williams Brothers Corp., will begin laying a 72-mile 6-in. natural-gas line for this company from Salem to the Texas Co. refinery at Lawrenceville, Ill. The 101-mile 6-in. crude-oil line being laid for Texas Pipe Line Co. by Black Construction Co. from Apache to Seminole, Okla., is half completed.

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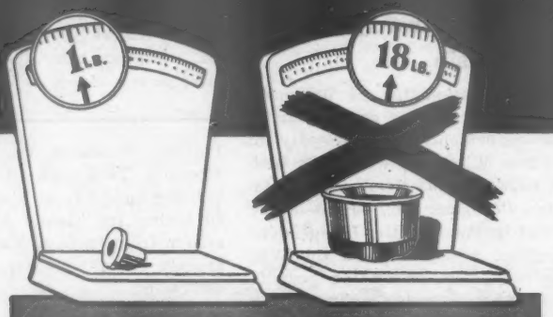

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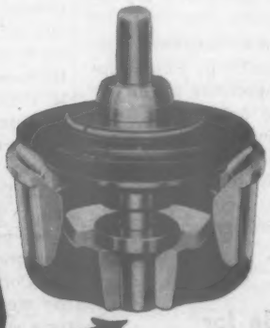

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

M-68 has at last begun definitely to take its toll of completions. Last week 480 were reported of which 115 were dry holes. This represents a decline of 73 from the preceding week, of which 63 were oilers, and 10 were dry holes. From all districts come reports of continued shutdowns, of lack of new locations, and particularly of the absence of exceptions permitting normal drilling operations. On the surface, things do not appear alarming. Completions this year are still in excess of the corresponding period of 1941. Production is being maintained at a high level. Wildcats are still being drilled and discoveries are being made with uniform regularity.

Many commentators have referred to the industry's folly in stating that much additional production could be had by simply turning valves. The statement was correct and still is, although not to the extent that it was last summer. The fact is, however, that neither the industry nor any qualified spokesman for the industry claimed that the high rate of production could be maintained simply by leaving the valves turned on. The oil industry was prepared, and still is prepared to meet a sudden demand for more oil but if that demand is long to be continued, more wells must be drilled to maintain the supply. Not merely as many wells as in 1941, but more wells.

Production may be maintained at a high level at the present time and no enforced falling off may be seen for some time. The worst that may happen in 1942 is that many fields will be overproduced and much otherwise recoverable oil will be lost. However, the record of all producing fields shows that even though proration holds down the peak and extends the time when decline takes place, that decline is as inevitable as death and taxes.

Finally, wildcats, even if successful, do not produce much oil. The production statistics presented elsewhere in this issue show no one-well fields with important production. Once the field is found, it must be produced. Many discoveries are small and operators may not be willing to risk stepping off ¼ mile from the discovery unless they have a pretty good picture to go on. The undrilled locations are known. Operators are ready to drill them and reservoirs are losing irreplaceable energy while the locations are lying idle and other wells have their allowables stepped up to meet the increased demand. There is urgent need for permits to drill for the oil that we know is available.

Encouragement for the wildcatter is all very well but is only half of the encouragement that is needed. The producer could do with some. The drilling contractor with idle tools, some of his men in the armed forces and the rest going into other jobs because there are no wells to drill may find that when he is able to drill he will have no trained crews. Then when more oil is needed it will take more wells to get it than are now required.

SOUTHWEST TEXAS: The second well in the new McLean field southwest of Bruni is running high. The Wilcox sand at Washburn is extended ¼ mile south. The Yegua sand discovery at Alice continues to improve. This is the first discovery in the Yegua in this sector (p. 224).

TEXAS GULF COAST: Midway between the Joe's Lake and Camp Eleven fields which produce from the Wilcox a test flowed oil from the lower Cockfield and reported showings in the upper section also. A Wilcox sand producer is reported in the Mercy area, San Jacinto County. Oil has been found in the Frio sand in the Needville gas-distillate field (p. 216).

WEST TEXAS: Simpson production at Abell has been extended ¼ mile south. Pure's prospective Delaware sand discovery in Pecos County flowed on test with an estimated 10,000,000 cu. ft. of gas. A test between Johnson and Harper is making a small amount of oil with some water (p. 215).

NORTH TEXAS: New Caddo lime production is reported from Clay County north of the Henderson pool. The second well in the Wynn pool, Clay County, flowed 426 bbl. from Mississippi lime through choke. A wildcat southwest of Holliday, Archer County, is showing oil (p. 223).

ALBERTA: A ½-mile north outpost to Turner Valley promises to be a record well and another well ½ mile farther north is looking favorable, although down on the structure (p. 229).

CALIFORNIA: A wildcat south of the Rancho San Francisco area in Newhall-Potrero is running 50 ft. higher than the field wells. A west outpost to Raisin City is dry (p. 217).

LOUISIANA GULF COAST: A second Wilcox pay is reported in the Neale field. A shallow sand has been opened at Bayou des Allemands (p. 216).

WEST CENTRAL TEXAS: Wimberly has been extended a short distance to the west (p. 223).

NEW MEXICO: Barker dome, San Juan County, gas pool tapped originally in 1924 but abandoned, is being reopened (p. 221).

COLORADO: A closely watched wildcat in Cheyenne County reports a showing in lime at 4,810 ft. (p. 221).

ARKANSAS: Development is getting rapidly under way in the new Midway field, Lafayette County. Fifteen permits have been issued and drilling has started at 12 of the locations (p. 225).

KANSAS: A new Mississippian lime producing area has been opened north of Bornholdt. Kraft has been extended 1 mile south of Abbyville, ¼ mile east (p. 214).

OKLAHOMA: The Layton sand is producing in the tenth test on the Navina structure, Logan County (p. 214).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended January 24, 1942)

	Oil	Gas	Dry	Total	Footage	Tl. comp. to date 1942	Tl. comp. to date 1941
N. Y., Pa., and W. Va.	78	11	6	95	193,037	419	339
Ohio	6	7	5	18	45,286	100	94
Indiana	2	1	2	5	8,147	53	26
Kentucky	1	1	2	4	5,034	43	32
Illinois	43	1	14	58	154,774	244	206
Michigan	6	3	4	13	28,164	67	53
Kansas	18	3	8	29	79,813	149	118
Nebraska	2	0	1	3	6,581	3	10
Missouri, Iowa	0	0	0	0	0	0	0
Oklahoma	17	4	15	36	110,339	119	105
Texas:							
North Central Texas	20	1	10	31	77,454	150	167
West Texas	26	0	6	32	142,695	160	138
Texas Panhandle	16	3	0	19	58,192	70	31
East Texas	8	1	3	12	56,948	46	88
Texas Gulf Coast	11	2	2	15	83,862	86	65
Southwest Texas	19	3	11	33	126,822	129	98
Total Texas	100	10	32	142	545,973	641	587
North Louisiana	6	3	5	14	46,601	70	40
Louisiana Gulf Coast	8	0	3	11	85,190	74	57
Total Louisiana	14	3	8	25	131,791	144	97
Arkansas	1	1	0	2	14,664	13	15
Mississippi and Southeast	5	0	0	5	18,719	19	11
Montana	1	6	2	9	12,075	16	22
Wyoming	2	0	0	2	9,052	6	15
Colorado	0	0	1	1	5,994	1	0
New Mexico	6	0	2	8	27,696	26	26
California	12	0	13	25	99,277	93	90
Total United States	314	51	115	480	1,496,416	2,156	1,846
Total previous week	377	51	125	553			
Week ended Jan. 25, 1941	307	33	115	455			

OKLAHOMA FIELD REPORT

Tenth Test of Navina High Makes a Well From Layton

By ROBERT INGRAM

FOR years Oklahoma oil men have believed good production would be found on the Navina structure in southwestern Logan County. They drilled nine wildcats at various locations along the eastern line of Township 15-4w. The tenth, Cities Service 1 Babcock, SE NE NE 10-15-4w, came in last week as an oil well. After Cimarron Valley Pipe Line Co. made connections to run the crude to the Champlin Refining Co. at Enid, the well flowed 348 bbl. in 10 hours after cleaning out. Gas was estimated at 1,250,000 cu. ft. a day.

Like all the other nine tests, the 1 Babcock went to the Wilcox (topped at 6,801 ft.), found that zone dry. Then it plugged back to the Upper Layton zone at 5,010-43 ft. to make a well. Since the discovery is but ¾ mile from a dry hole in the same section and is either north or west of the other tests drilled on the structure, Oil Editor Claude Barrow of the Daily Oklahoman, concluded "the structure must trend to the northwest—who can tell which way a ghost goes from a graveyard?"

Apache Fault-Finder to Whipstock

As good completions continued at the Apache pool in Caddo County (see below), Cities Service Oil Co. was the fourth operator to get into the pay. The company staked 1 Ke-Har-To, NE 11-5-12w, ½ mile southeast of production.

At the same time Texas Co. was starting a directional hole at 3 Mulkahay, SW NE SE 2-5-12w, an east edge test which ran into a faulted condition and stopped at 3,530 ft. The well was plugged back to set whipstock at 2,424 ft.

OKLAHOMA COMPLETIONS

Wildcats

Cotton County: Taylor & Davis 1 Schussler, SW SE NE 14-6s-14e, dry, show gas 825 ft., T.D. 1,271 ft.

Hughes County: Paul J. McIntyre 1 Thomason, NE SW NE 7-9-11, dry, Cromwell 3,027 ft., T.D. 3,122 ft.

Kay County: McKnabb 1 School Land, SE SE SW 13-27-2, dry, Arbuckle 4,083 ft., T.D. 4,201 ft.

Lincoln County: Leader Oil 1 Morrow, SE NW NW 5-15-6, old well, old T.D. 3,780 ft., T.D. 4,025 ft., flowed 3 bbl.

Okfuskee County: Droppleman 1 Dolly, NE NE SW 2-11-7, dry, Cromwell 3,710 ft., T.D. 3,874 ft.

Oklahoma County: Continental 1 Boling, NW NW SW 18-14-3w, dry, Hunton 6,162 ft., Viola 6,440 ft., Wilcox 6,222 ft., T.D. 6,760 ft.

Seminole County: Willis & Comail 1 Amason, SW SE NE 18-6-6, dry, second Wilcox 4,060 ft., T.D. 4,082 ft.

Fields

Apache, Caddo County: Amerada 1 To-Who, NE NW SW 2-5-12w, flowed 208 bbl. in 1 hr. through 1-in. choke on tubing, Bromide 3,325 ft., sand 3,443 ft., pay 3,464 ft., T.D. 3,761 ft.

Texas 4 Mulkehay, NE SE SE 2-5-12w, flowed 493 bbl. in 1 hr., 3,000,000 cu. ft. gas, Bromide 3,291 ft., pay 3,494 ft., T.D. 3,675 ft.

Texas 1 Achilita, SW SW SW 35-6-12w, flowed 249 bbl. in 1 hr., 586 bbl. in 6 hr. through 1-in. choke on tubing, Bromide 3,533 ft., pay 3,708 ft., T.D. 3,829 ft.

Sinclair 1 Lewis, NE NE SW 2-5-12w, old well, old T.D. 3,342 ft., T.D. 3,500 ft., flowed 257 bbl. in 1 hr.

Blackwell, Kay County: Floosmar Oil & Gas 1 School land, NW SW 16-27-1w, dry, Arbuckle 3,628 ft., T.D. 3,637 ft.

Clipper Oil 4 Humphrey, NE SW SW 10-27-1w, pumped 20 bbl. Stahlnaker 2,330-40 ft., T.D. 2,340 ft.

Chickasha, Grady County: Phillips 1 Neal, NE NE 21-5-8w, dry, T.D. 6,055 ft.

Cushing, Creek County: Sinclair 18 Yahola, C NW 9-17-7, pumped 24 bbl. oil and 60 bbl. water, Bartlesville 2,637-2,725 ft., T.D. 2,728 ft.

Dora, Seminole County: Thompson Brothers 2 Hemrick, SE NW NW 34-7-6, dry, Earlsboro 2,755 ft., T.D. 2,850 ft.

Doyle, Stephens County: Sun 2 Hefner, NW SW SE 12-1-5w, flowed 145 bbl. 38 gravity, sand 5,990-6,010 ft., T.D. 6,098 ft., *discovery of new deep sand.*

Empire, Stephens County: Ledford-Schiff 1-C Taliaferro, E½ SW 27-1s-8w, pumped 160 bbl. oil, 4 per cent water, pay 2,226-35 ft., T.D. 2,290 ft.

Palmer 1-A Eakes, SE NE SW 32-1s-8w, pumped 5 bbl., pay 1,590-96 ft., T.D. 2,454 ft.

Fish, Seminole County: Lanahan et al 2-A Fish, NW SW NE 19-7-8, location abandoned.

Garber, Garfield County: Sinclair 23 Campbell, N½ N½ N½ 30-22-3w, pumped 10 bbl., Garber 2,093 ft., T.D. 2,147 ft.

Guthrie, Logan County: McBride 4 Eastwood, SW NW SW 7-17-1w, old well, old T.D. 5,501 ft., Bartlesville 5,105-21 ft., P.B. 5,124 ft., flowed 290 bbl.

Hotulke, Pottawatomie County: Crosbie and Atlantic 1 Rowlett, SW NE SW 23-9-4, pumped 77 bbl. oil, Hunton 4,216 ft., pay 4,203-20 ft. and 4,360-80 ft., acid, T.D. 4,592 ft.

Grisso & Eason 1 Billington, SE NE NE 26-9-4, old well, T.D. 4,508 ft., perf. Hunton 4,345-92 ft., pumped 23 bbl.

West Hotulke, Pottawatomie County: Atlantic 4 Higbee, NW SW SW 22-9-4, pumped 410 bbl., Viola 4,498-95 ft., T.D. 4,706 ft.

Keokuk, Seminole County: Carter 2 Riddle, S½ NE SE 35-11-6, swabbed 285 bbl., Wilcox 4,348 ft., T.D. 4,354 ft.

Laffoon, Lincoln County: Buell & Herndon 1 Gray, NW SW 3-13-6, 7,500,000 cu. ft. gas, 760 lb. R.P., Hunton 4,133-41 ft., T.D. 4,141 ft.

West Okemah, Okfuskee County: Deep Rock 1 Henaha, NW NW SW 21-11-9, 6,000,000 cu. ft. gas, 1,100 lb. R.P. Cromwell 3,446-63 ft., T.D. 4,023 ft., *discovery of new pay zone.*

Deep Rock 1 Owen-A, NW NE SE 20-11-9, old well, old T.D. 3,960 ft., P.B. 3,388 ft., perf. Cromwell 3,370-83 ft., gaged 4,500,000 cu. ft. gas.

Oklahoma City, Oklahoma County: H. & H. Drilling 1 Whitfield, SE NE SE 34-12-3w, old well, old T.D. 6,414 ft., T.D. 6,445 ft., shot 6,400-45 ft., pumped 210 bbl.

Velma, Stephens County: Skelly 3 Frensley, NW SW NW 36-1s-5w, gaged 2,500,000 cu. ft. gas, 345 lb. R.P., sand 1,268 ft., T.D. 1,275 ft.

Skelly 14 Nichols, NW SW SE 36-1s-5w, pumped 14 bbl. in 4 hr., sand 685 ft., T.D. 803 ft.

Mudge 9 Cobb-A, NE NW NE 1-2s-5w, pumped 17 bbl., sand 712-812 ft., T.D. 812 ft.

Northeast Wewoka, Seminole County: Hall-Jordan 1 Mainard, N½ SW SW 9-8-8, dry, Hunton 4,015 ft., T.D. 4,154 ft.

Miscellaneous

Muskogee County: C. B. Tierney 5 Dillon, SE SW NE 17-13-16, pumped 18 bbl., sand 2,084-41 ft.

Culbertson 2-A Thompson, SW SW SW 3-14-15, dry, T.D. 975 ft.

R. V. Dillard 1-A Fink, SW SE NW 20-15-15, pumped 7 bbl., pay 1,475-85 ft., T.D. 1,565 ft.

Okfuskee County: W. C. McBride 2 McMahon, NW SE NE 15-11-10, dry, Cromwell 3,172 ft., T.D. 3,285 ft.

Champlin 3 Lewis, SE SE SE 15-11-11, old well, old T.D. 2,725 ft., Viola 3,425 ft., T.D. 3,474 ft., pumped 14 bbl.

Osage County: Bay Oil 2 Osage, SW SW SE 21-28-7, pumped 35 bbl., Mississippi chat 2,769-2,812 ft., T.D. 2,854 ft.

Birch 10 Osage, NW SW SE 36-22-8, dry, T.D. 470 ft.

Keener 7 Devinne, W½ NE NW 13-21-12, dry, Burgess 1,420 ft., T.D. 1,465 ft.

Norbla 1 Osage, SE SE SE 29-21-10, dry, Hominy Wilcox 2,461 ft., T.D. 2,606 ft.

Tulsa County: John T. Gibson 1 Carney, SW SE NE 6-18-14, 50,000 cu. ft. gas, pay 682-88 ft., T.D. 1,000 ft.

KANSAS, NEBRASKA

Pool Opened In Rice County North of Bornholdt

By ROBERT INGRAM

Nelson Drilling Co. 1 George Smyers, NE SW 36-19-6w, opened a new oil pool 2 miles north of the Barnholdt pool the past week. The test flowed 60 bbl. of oil per hour natural after gaging 75 bbl. in 1 hour and 15 minutes into lease tanks. There was no water reported with the oil.

The Smyers test is producing from the Mississippian chat topped at 3,321 ft. and drilled to a total depth of 3,354½ ft. Oil pay was logged from 3,339-54½ ft. in the formation. Late in the week, the well was placed on a temporary 15-bbl. minimum potential test until a bottom-hole pressure test could be taken.

Kraft and Abbyville Extended

Productive limits of the Kraft pool of northern Barton County were assured a 1-mile south extension. Luther E. Mackall 1 J. Disque, NW 23-17-11w, set and cemented casing for a production attempt after logging saturation in rotary cuttings in a 1-ft. penetration of the Arbuckle dolomite topped at 3,301 ft. The well is 1¼ miles northwest of the Bloomer pool, which is producing from the Lansing and Arbuckle dolomite formations.

Abbyville pool production was extended ¼ mile eastward Saturday by Skelly Oil Co, 1 Love, SL SE NE 24-24-8w, which filled 2,100 ft. with oil in 24 hours from Lansing lime series topped at 3,530 ft. After the well was deepened to 3,543 ft., crews acidized with 4,000 gallons. Placed on the pump, the well pumped 82 bbl. of oil and no water in 4 hours. It is now on state potential.

KANSAS COMPLETIONS

Wildcats

Barton County: Bay Petroleum 1 Penka, NW SE SE 22-16-12w, dry, T.D. 3,419 ft.

Brown County: John Gernon et al 1 Bruce, E½ SE SE 15-3-15e, dry, T.D. 625 ft.

Cowley County: Helmerich & Payne et al 1 Willson, W½ Lot 4, NW 31-34-8e, dry, Layton 1,860 ft., Bartlesville 2,720 ft., Mississippian 2,790 ft., T.D. 2,852 ft.

Marion County: Roscoe Mendenhall 1 Holob, SE SE SW 28-18-4e, dry, T.D. 340 ft.

Russell County: Aladdin Petroleum et al 1 Maier, SE SE SE 7-15-14w, dry, anhydrite 910 ft., Fort Riley 1,880 ft., Topeka 2,818 ft., Lansing 3,101 ft., Arbuckle 3,353 ft.

Stafford County: Champlin Refining 1 Thomas, N½ NW SW 29-25-11w, dry, Fort Riley 1,930 ft., Topeka 3,007 ft., Lansing 3,585 ft., Viola 4,123 ft., Arbuckle 4,282 ft.

Fields

Northwest Ainsworth, Barton County: Continental 2 Stoskopf, NW NW SW 28-16-13w, potential 417 bbl., Lansing 3,130-43 ft., T.D. 3,370 ft.

Beaumont, Greenwood County: K. T. Weideman 13 Lewis-A, SW NE NW 36-27-8e, dry, T.D. 1,090 ft.

Chase, Rice County: Bishop Oil 3 Reese, S½ NE NW 22-19-9w, potential 240 bbl., Lansing 2,923-35 ft., T.D. 3,216½ ft.

Northeast Davidson, Russell County: H. H. Blair 1 Foster-B, N½ NE SW 33-15-11w, potential 233 bbl., Arbuckle 3,264-69 ft.

East Frog Hollow, Cowley County: Phillips 3 Lena, NW SE SE 17-32-5e, potential 923 bbl., Bartlesville 3,037 ft., T.D. 3,064 ft.

Geneseo, Rice County: Continental 9 Ainsworth, NE NW NE 25-18-8w, potential 3,000 bbl., Arbuckle 3,128-3,204 ft.

Hall-Gurney, Russell County: Shell 2 Ruby, SE NW NE 36-14-13w, potential 1,971 bbl., Arbuckle 3,116-26 ft., T.D. 3,158 ft.

Henne, McPherson County: W. C. McBride 3 Anderson, N½ NW NE 21-17-1w, potential 886 bbl., Mississippian 2,657-69 ft.

McLouth, Jefferson County: Sherrod 1 Means, N½ NE NW 8-10-20e, gaged 7,500,000 cu. ft. gas, Bartlesville 1,499-1,516 ft.

Hatcher & Fisk 2 J. Schrader, NE SW 29-9-20e, gaged 1,500,000 cu. ft. gas, Bartlesville 1,473-90 ft., T.D. 1,495 ft.

E. V. Jackson 1 Schrader-Haas, NW SE 29-9-20e, old well, old T.D. 1,551 ft., dry.

Hatcher & Fisk 1 Myers, NE SW 29-9-20e, gaged 3,700,000 cu. ft. gas, Bartlesville 1,495-1,510 ft.

Niedenthal, Russell County: Transwestern 1 Smith, N½ NW SW 14-14-15w, potential 1,365 bbl., Gorham sand 3,204-07 ft.

Peace Creek, Reno County: Derby Oil 1 Mathes, SW SE SE 16-23-10w, potential 328 bbl., Viola 3,750-72 ft.

Ray, Phillips County: Cities Service 3 Noel, NE SE SE 29-5-20w, potential 1,648 ft., La Motte sand 3,565-82½ ft., T.D. 3,582½ ft.

Cities Service 1 Veeh, SW SE NW 31-5-20w, potential 1,284 bbl., La Motte sand 3,635-48 ft., T.D. 3,648 ft.

Rusch, Russell County: Westgate-Greenland 4 Rusch, W½ NE NE 29-14-14w, potential 102 bbl., Arbuckle 3,250-55 ft.

Severy, Greenwood County: Page & Cook 4 Hebb, N½ SE NE 8-28-11, location abandoned.

Silica, Barton County: Shell Petroleum 6 Kowalsky, SW SE SE 18-20-11w, potential 3,000 bbl., Arbuckle 3,286-98 ft.

(Continued on Page 220)

PERMIAN BASIN, PANHANDLE

Abell Ordovician Is Extended South By Good Producer

By TOM BARBER

MIDLAND, Tex.—Stanolind Oil & Gas Co. 1 Kistler, Section 5, Block 3, H.&T.C. Survey, last week assured the Abell Ordovician pool of northern Pecos County a ¼-mile south extension and at the same time indicated that it might make a large producer. Early in the week, the test flowed 60 bbl. of oil per hour on drill-stem tests of two pay horizons of the McKee sand of the Simpson, Middle Ordovician.

First oil production was obtained the last 2 minutes of a 9-minute drill-stem test at 5,253-5,300 ft. Flow was estimated at the rate of 60 bbl. hourly, with gas volume of 700,000 cu. ft. daily. Operator then cored 1 Kistler from 5,300 ft. to 5,335 ft. and again reported an oil flow estimated at 60 bbl. per hour on a drill-stem test from 5,301-35 ft.

SOUTHERN WEST TEXAS COMPLETIONS

(24-hr. rating based on last 3 hr. of 6-hr. gage)

Wildcats

Pecos County: Stanolind-Superior 1 Thrapp-Walker, elev. 2,391 ft., 23 bbl. oil and 25 bbl. water, pumping, top Simpson 5,025 ft., top Tulip Creek 5,045 ft., top McKee sand 5,360 ft., top Waddell 5,837 ft., 4,000 gal. acid 3,100-50 ft., T.D. 5,899 ft.

Fields

Abell (Permian), Pecos County: Tide Water 1 J. W. Lutz, elev. 2,379 ft., 429 bbl., ½-in. choke, pay 3,938-50 ft.
Stanolind 1 Rathjen-Simmons, elev. 2,378 ft., 331 bbl., ½-in. choke, pay 3,900-18 ft., T.D. 3,960 ft.
Foster, Ector County: Sinclair 31-A Johnson, elev. 2,980 ft., 457 bbl., pumping, 320-qt. shot 4,089-4,159 ft.
Standard 3 Cochran, elev. 3,091 ft., 470 bbl., 360-qt. shot 4,120-4,206 ft., T.D. 4,214 ft.
Keystone (Lime), Winkler County: S. W. Richardson 1-B Keystone, elev. 2,977 ft., 290 bbl., 1-in. choke, 270-qt. shot 3,403-87 ft., T.D. 3,495 ft.
Keystone (Colby sand), Winkler County: Standard 32-19 Baird, elev. 2,927 ft., 536 bbl., 360-qt. shot 3,220-3,365 ft., T.D. 3,372 ft.
North Cowden, Ector County: Stanolind 27-G Smith, elev. 3,056 ft., 422 bbl., pumping, 540-qt. shot 4,135-4,315 ft., T.D. 4,325 ft.
Pecos Valley, Pecos County: Culbertson & Irwin 1-A Eaton, elev. 2,440 ft., 9 bbl., pumping, 67-qt. shot 1,600-27 ft.
Sand Hills (Permian), Crane County: Magnolia 9 Lea, elev. 2,630 ft., 235 bbl., 1-in. choke, pay 4,400-4,700 ft.
Taylor-Link, Pecos County: D. Breeding 1 University, elev. 2,544 ft., dry at 1,700 ft.
World, Crockett County: J. R. Dunaway 1-A A. C. Hoover, elev. 2,229 ft., dry at 2,000 ft.

NORTHERN WEST TEXAS COMPLETIONS

(24-hr. rating based on last 3 hr. of 6-hr. gage)

Wildcats

Gaines County: Amerada 1 Ruth Hudson, elev. 3,616 ft., dry at 5,036 ft., top anhydrite 2,131 ft., top Yates 3,030 ft., top brown lime 4,040 ft., top San Andres 4,560 ft.
Hockley County: Stanolind 1 Victor Williams, elev. 3,514 ft., dry at 6,500 ft., top anhydrite 1,960 ft., top brown lime 3,360 ft., top San Andres 3,660 ft.
Tide Water 1 Commerce Trust, elev. 3,513 ft., dry at 5,201 ft., top brown lime 3,840 ft., top San Andres 4,210 ft.

Fields

Cedar Lake, Gaines County: Continental and Carter 15-44 Langdon, elev. 3,542 ft., 966 bbl., 11,000 gal. acid 4,875-5,025 ft.
Emma, Andrews County: Sinclair 15 Cowden, elev. 3,149 ft., 990 bbl., 3,000 gal. acid 4,190-4,250 ft.
Iatan-East Howard, Howard County: Bond & Awoeb 7 Denman, elev. 2,278 ft., 305 bbl., 800-qt. shot 2,665-2,882 ft.
Slaughter, Cochran County: Anderson-Prichard 3 Neal, elev. 3,679 ft., 529 bbl., 2½-in. casing outlet, 10,000 gal. acid 4,918-61 ft.
Honolulu 17-13 Igoe & Smith, elev. 3,664 ft., 660 bbl., 2½-in. casing outlet, 10,000 gal. acid 4,970-5,040 ft.
Honolulu 28-13 Igoe & Smith, elev. 3,669 ft., 1,034 bbl., 2½-in. casing outlet, 10,000 gal. acid 4,985-5,050 ft.
Magnolia 22 Woodley, elev. 3,678 ft., 909 bbl., 3-in casing outlet, 10,500 gal. acid 4,935-85 ft.
Slaughter, Hockley County: Honolulu 14 Frazier, elev. 3,507 ft., 1,970 bbl., 2½-in. casing outlet, 10,000 gal. acid 4,870-4,960 ft.
Honolulu 27-13 Slaughter, elev. 3,521 ft., 1,213 bbl., 3-in. casing outlet, 10,000 gal. acid 4,930-5,028 ft.
Magnolia 8-F Mallett, elev. 3,604 ft., 1,475 bbl., 3-in. casing outlet, 10,500 gal. acid 4,953-5,014 ft.
Magnolia 15-G Mallett, elev. 3,605 ft., 1,492 bbl., 3-in. casing outlet, 10,500 gal. acid 4,945-5,020 ft.
Texas 84 Slaughter, elev. 3,547 ft., 2,230 bbl., 12,000 gal. acid 4,930-5,020 ft.
Texas 87 Slaughter, elev. 3,532 ft., 1,623 bbl., 12,000 gal. acid 4,905-5,000 ft.
Wasson, Yoakum County: American Liberty 3-B Bennett, elev. 3,574 ft., 134 bbl., 4.6 per cent water, 10,500 gal. acid 5,090-5,244 ft.
Shell 5 Kendrich, elev. 3,574 ft., 1,781 bbl., 10,000 gal. acid 4,855-5,123 ft.
Sinclair 1 C. J. Kleiner, elev. 3,630 ft., dry at 5,600 ft., top Yates 3,360 ft., top brown lime 4,320 ft., top San Andres 4,710 ft.
West Andrews, Andrews County: Texas 3-J University, elev. 3,159 ft., 293 bbl., pumping, 3,000 gal. acid 4,225-4,335 ft.

TEXAS PANHANDLE COMPLETIONS

Carson County: Cities Service 45-A Burnett, Sec. 34, Blk. 4, I.&G.N. Sur., 36,500,000 cu. ft. gas, pay 2,360-2,505 ft., T.D. 2,534 ft.
Gray County: Dorsyann Oil Co. 4 Bull, Sec. 3, Blk. B-2, H.&G.N. Sur., 81 bbl., pay 2,875-2,917 ft.
Cities Service 24-B Hughey, Sec. 129, Blk. 3, I.&G.N. Sur., 63 bbl., pay 3,160-3,217 ft.
S. & M. 14 Worley, Sec. 63, Blk. 3, I.&G.N. Sur., 43 bbl. in 3 hr., 570-qt. shot 3,148-3,232 ft.
Crenshaw Oil & Gas Co. 9 Benton, Sec. 63, Blk. 3, I.&G.N. Sur., 138 bbl., pumping, 405-qt. shot 3,009-3,167 ft., T.D. 3,177 ft.
Phillips 5 Swanson, Sec. 87, Blk. B-2, H.&G.N. Sur., 252 bbl., pumping, 420-qt. shot 2,940-3,067 ft.
Texas 1 Benedict, Sec. 55, Blk. B-2, H.&G.N. Sur., 258 bbl., pumping, 450-qt. shot 2,959-3,040 ft., T.D. 3,042 ft.
Texas 12-A Chapman, Sec. 50, Blk. A-9, H.&G.N. Sur., 123 bbl., pumping, 360-qt. shot 2,690-2,770 ft.
Hutchinson County: J. M. Huber 21 Weatherly, Sec. 26, Blk. Y, A.&B. Sur., 198 bbl., pumping, pay 2,995-3,057 ft., T.D. 3,064 ft.
Phillips 3 Minnie Byrd, David Luce Sur., 6,200,000 cu. ft. gas, pay 2,705-2,975 ft., T.D. 3,047 ft.
Phillips 89 Cockrell Ranch, Sec. 11, Blk. B-3, D.&S.E. Sur., 203 bbl., pumping, 460-qt. shot 2,813-3,000 ft., T.D. 3,014 ft.
Shamrock Oil & Gas Corp. 2 Stewart, Sec. 19, Blk. M-16, A.B.&M. Sur., 210 bbl. oil and 12,500,000 cu. ft. gas, pay 3,160-64 ft.
Shell 41-B Harvey, Sec. 14, Blk. M-21, T.C. Sur., 302 bbl., pumping, 165-qt. shot 3,018-80 ft.
Smith Bros. 1 Huber-Herring, George Bason Sur., 74 bbl., pumping, 320-qt. shot 3,201-85 ft., T.D. 3,296 ft.
Stanolind 5 Jasper, Sec. 13, Blk. V, Hedgecoke Sur., 115 bbl., pumping, 220-qt. shot 3,085-3,170 ft.
Stanolind 14 Lewis, Sec. 7, Blk. 23, B.S.&F. Sur., 140 bbl., pumping, 370-qt. shot 2,887-3,010 ft.
Stansylvania Oil Co. 2 Lewis, Sec. 6, Blk. 23, B.S.&F. Sur., 12 bbl., pumping, 290-qt. shot 2,966-3,046 ft.
Texas 14 J. W. Moore, Sec. 21, Blk. M-21, T.C. Sur., 33 bbl. in 6 hr., pumping, 290-qt. shot 3,090-3,140 ft.
Moore County: Phillips 1 Balfield, Sec. 228, Blk. 3-T, T.&N.O. Sur., 14,600,000 cu. ft. gas, 335-qt. shot 2,975-3,203 ft., T.D. 3,205 ft.

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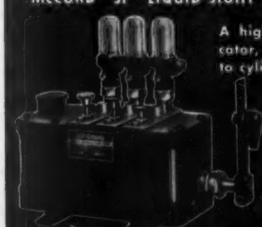

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TEXAS GULF COAST

Cockfield Sand Produces Near Tyler County Wilcox Fields

By NEIL WILLIAMS

HOUSTON, Tex.—An important Cockfield sand discovery appears to have been opened in southeastern Tyler County where preparations were being made to test American Republics and Houston Oil Co. 2 Cushing, after a drill-stem test recovered pipe-line oil. Casing was cemented on bottom at 5,406 ft., and a test is expected to be made at 5,390-5,406 ft. where a 35-minute drill-stem test showed 250 lb. working pressure, and the well flowed oil in 35 minutes. The well flowed 1 hour after the testing tool was closed, and when it was broken down, 14 thribbles of oil and 15 ft. of salt water was recovered. The sand apparently is the lower Cockfield, and it is possible that production may eventually be produced from the upper section as a drill stem testing at 5,259-67 ft. tested 880 lb. working pressure. The top of the Cockfield was not released.

The well is located in the T. Cushing Survey, about 1⅛ miles northeast of the new Camp Eleven field, and about the same distance southwest of the Joe's Lake field, both of which produce from the Wilcox and are void of any Cockfield production. This marks the discovery as being located on a separate structure, and it is the third to be found in the county within recent months, all being located within a radius of 5 miles.

Wilcox Trend Tests

Shell 1 Central Coal & Coke Co., a Wilcox test located in the Mercy area, San Jacinto County, was reported to be showing for a producer while testing the Wilcox, but no information is available as to where the well was tested or how much fluid it was making. Total depth is 8,305 ft. This company has been the most active major company to engage in Wilcox sand development, and the completion of the present well as a commercial producer will make the third field it has opened along the trend. However, detailed information on all discoveries has been withheld.

Prospects of opening shallow Wilcox sand production, 4 miles south of Huntsville, Walker County, were not encouraging as J. O. Ehlinger et al 1 Foster estate, bailed dry when tested through perforated casing at 2,036-46 ft., and at the end of the week the hole was being swabbed after reperforating at 2,060-70 ft. There was no show of oil. Total depth is 2,500 ft.

Houston Discovery Recompleted

Along this same trend, and located in the Lovelady area, Houston County, C. P. Culmore reperforated casing at 3,215-20 ft., and the well pumped from 6 to 7 bbl. of fluid per hour, of which 30 per cent was b.s. and w. with a taste of salt water. The operator will continue to pump until the well is cleaned. Approximately 2½ miles north of this well, O. W. Killam is scheduled to move in material for 1 Houston County Coal Co., located on a block of approximately 2,500 acres centering in the James Henley Survey.

Tops Made Public

Geological markers on Phillips 1 M. E. Mitchell, located on the Millican prospect, Brazos County, abandoned the previous week in salt at 5,511 ft., have been released. The Operculina was topped at 2,390 ft., Weches at 2,690 ft., Wilcox 3,385 ft., anhydrite 4,890 ft., dome material 4,970 ft., and salt formation at 5,170 ft. There were no shows logged, and the company is engaged in drilling a second well, about 2 miles southeast.

Needville Becomes Oil Field

The Needville gas-distillate field, Fort Bend County, was converted into an oil field with the completion of W. L. Goldston 1 A. Smith, which flowed 244 bbl. of 24.1-gravity oil daily through a ¼-in. choke from perforated casing opposite the Frio sand at 5,190-94 ft. Tubing pressure was 225 lb., and shut-in casing pressure 650 lb. The well is located in the F. Madings Survey about 1,200 ft. south of the discovery well, completed the past year at 5,176-80 ft.

TEXAS GULF COAST COMPLETIONS

Wildcats

Brazoria County: West Production 1 C. C. Cowell, top Discorbis 4,111 ft., Heterostegina 5,198 ft., Marginulina 5,275 ft., Frio 5,377-5,419 ft., Vicksburg 5,791-5,867 ft., Textularia Hockleyensis 6,035 ft., dry, T.D. 6,471 ft.

Fields

Bammel, Harris County: F. M. Corzelious 1 Meineke, 80,000,000 cu. ft. gas, open flow, sand 6,178-6,202 ft., T.D. 6,204 ft.

Camp Eleven, Tyler County: American Republics and Houston Oil Co. 1 Cushing, 612 bbl., ¼-in. choke, perf. casing 8,000-10 ft., T.D. 8,035 ft.

Conroe, Montgomery County: John Blaffer 2 Butler, 156 bbl. fluid, 25 per cent oil, balance salt water, ¼-in. choke, perf. casing 5,080-82 ft., T.D. 5,200 ft.

Dyersdale, Harris County: Jack Frazier 1 D. H. Smith, 146 bbl., ¼-in. choke, perf. casing 4,062-75 ft., T.D. 4,083 ft.

Goodrich, Polk County: Pan American 1 Broman, dry, T.D. 4,053 ft.

Nome, Jefferson County: Shell 10 Carpenter, 558,000 cu. ft. gas, ⅛-in. choke, sand 4,411-26 ft.

North La Ward, Jackson County: Humble 2 Four Way ranch, 341 bbl., ¼-in. choke, sand 5,210-17 ft.

Magnolia 7 W. H. Gordon, 72 bbl., 9/64-in. choke, perf. casing 5,212-17 ft., T.D. 5,225 ft.

Magnolia 10 Gordon, 116 bbl., ⅛-in. choke, perf. casing 5,219-22 ft., T.D. 5,225 ft.

North Markham, Matagorda County: Ohio 15 J. C. Carlson, 214 bbl., ⅛-in. choke, perf. casing 7,710-17 ft., T.D. 8,125 ft.

Withers, Wharton County: F. W. Michaux 24-A Pierce, 177 bbl., 5/32-in. choke, perf. casing 5,346-50 ft., T.D. 5,400 ft.

F. W. Michaux 25-A Pierce, 154 bbl., 5/32-in. choke, perf. casing 5,360-68 ft., T.D. 5,400 ft.

F. W. Michaux 34-A Pierce, 187 bbl., 5/32-in. choke, perf. casing 5,340-46 ft., T.D. 5,400 ft.

F. W. Michaux 39-A Pierce, 173 bbl., 5/32-in. choke, perf. casing 5,378-80 ft., T.D. 5,398 ft.

LOUISIANA GULF COAST

Second Deep Wilcox Pay Opened at Neale Field

By F. L. SINGLETON

NEW ORLEANS, La.—Production from a second and deeper sand in the lower Wilcox was opened in the Neale field, Beauregard Parish, with the completion of Atlantic 1 Hawkins unit, located on the southwest side of the structure, which is flowing at the rate of 186 bbl. daily through a ⅞-in. choke. Tubing pressure was 1,150 lb. The well was plugged back and completed through perforated casing at 11,532-74 ft. after several attempts to complete in sand below 12,000 ft. failed. This is the third producer in the field to be completed in the lower Wilcox from which production was originally opened the past year at intervals from 10,998-11,028 ft.

Along the upper sector of the trend, Phillips Petroleum Co. was preparing to spud 1 Overton, located in 15-4n-3e. The location is south of the Catahoula Lake area, where Carter-Phillips 1-B State is drilling in shale below 5,000 ft. The Wilcox was topped at 2,873 ft. and an electrical survey failed to show any encouragement to a depth of 4,376 ft.

Shallow Pay at Des Allemands

Amerada Petroleum Corp. opened production from a shallow sand on the north side of the Bayou Des Allemands field in St. Charles Parish with the completion of 1 T. D. Sellers. The well was drilled to a total depth of 10,334 ft., and was completed through perforated casing at 5,424-38 ft. for an initial production of 162 bbl. daily through a 9/64-in. choke. This is a deep-seated salt dome structure on which seven wells have been completed in various sands at intervals from 6,700 ft. to 9,800 ft.

Lakeside May Be Extended

In the Lakeside field, Cameron Parish, Lisbon-Iberia Oil Co. was attempting to complete 2 Calcasieu National Bank after drilling to a total depth of 10,110 ft. An electrical survey showed gas sand at 9,820-90 ft., which is equivalent to sand found in the company's 1 Calcasieu National Bank. The 10,000-ft. sand was not present. Completion for a producer will extend production several hundred feet northwest.

Thornwell Discovery

Although not officially completed, Cities Service Oil Co. 1 Lacassine, has apparently opened distillate production on the Thornwell prospect, Jefferson Davis Parish, as the well flowed 27⅛ bbl. of distillate and 70 bbl. of salt water daily while testing through perforated casing at 10,319-21 ft. The well was tested through a 9/64-in. choke with tubing pressure varying from 3,750-3,900 ft. Gas volume was estimated at 1,500,000 cu. ft. Following the test, the well was shut in for 40 minutes and the pressure built up to 6,300 lb. Testing continues, but the well is expected to be killed and retested, probably in a higher sand, logged around 9,800 ft.

Bayou Sale Defined

The limits of the active Bayou Sale field, St. Mary Parish, were defined to some extent with the abandonment of Texas 1 State-East Cote Blanche, a west outpost which was abandoned at a depth below 11,500 ft. This is the second failure for the field which was defined to the northeast shortly after it was opened the past year. As the field was being defined, Humble 2 Marin was flowing at the rate of 240 bbl. of oil daily while testing the regular field pay at 10,100 ft. The same company staked location for 1 Gates, an outpost located on the north side of the structure in 13-16s-9e.

LOUISIANA GULF COAST COMPLETIONS

Wildcats

La Fourche Parish: Ernest Cockrell 1 La Fourche Land Co., dry, T.D. 7,834 ft.

Terrebonne Parish: Gulf 1 Eschete, dry, T.D. 12,001 ft.

Fields

Anse La Butte, St. Martin Parish: Ownby Drilling Co. 1-A J. Martin, dry, T.D. 1,794 ft.

Stanolind 4-B J. J. Martin, 211 bbl., 9/64-in. choke, perf. casing 6,092-6,125 ft., T.D. 6,389 ft.

Bayou Des Allemands, St. Charles Parish: Amerada 1 T. D. Sellers, 162 bbl., 9/64-in. choke, perf. casing 5,424-38 ft., T.D. 10,334 ft.

Chacahoula, La Fourche Parish: Sun 12 Dibert-Stark & Brown, 207 bbl., 9/64-in. choke, perf. casing 7,248-72 ft., T.D. 7,425 ft.

Leeville, La Fourche Parish: Texas 87 L. L. and E. Leeville, 178 bbl., ⅛-in. choke, perf. casing 8,475-95 ft., T.D. 9,080 ft.

North Crowley, Acadia Parish: Humble 1 Ohlenforst, 170 bbl., ⅛-in. choke, perf. casing 8,556-90 ft., T.D. 8,600 ft.

Paradis, St. Charles Parish: Texas 17 L. L. and E. Paradis, 503 bbl., ¼-in. choke, perf. casing 10,160-70 ft., T.D. 10,425 ft.

Richie, Acadia Parish: Vincent, Welch & Nicklos 4 Hayes, 52 bbl., 9/64-in. choke, T.D. 3,508 ft.

St. Gabriel, Iberville Parish: George Echols 3-A Natalbany Lumber Co., 216 bbl., 3/64-in. choke, top sand 7,788 ft., T.D. 7,800 ft.

Sulphur, Calcasieu Parish, Union Sulphur Co. 756 fee, old well, perf. casing 3,612-27 ft., T.D. 5,366 ft.

CALIFORNIA FIELD REPORT

Unresticted Production Is Urged for Stripper Wells

By L. P. STOCKMAN

LOS ANGELES, Calif.—A suggestion to eliminate stripper wells in California from any and all curtailment is receiving careful consideration by the Production Committee of District 5 and it is quite likely that the proposal will be approved in the near future. It has not yet been determined what will constitute a stripper well in the meaning of the suggestion, but a recent check showed there were 11,555 wells in California that have a producing capacity of less than 25 bbl. per day each.

Of this group 4,021 wells have a potential of 4 bbl. per day or less; 3,076 can produce between 5 and 9 bbl. daily; 2,100 wells can produce wide open between 10 and 14 bbl. per day; 1,338 between 15 and 19 bbl. daily, and 1,021 wells could produce without restraint between 20 and 24 bbl. per day. It has been estimated that stripper wells of the state approximate 60 per cent of the total productive wells.

It is possible some attempt will be made to limit the number of producing wells per lease. To date there has not been very much curtailment in the lowest grade of stripper wells although some properties are pumped intermittently. Lifting of curtailment obligations on stripper wells will automatically increase production of heavy crude oil, a commodity that has been in good demand. Exemption of this class of wells may also result in the opening up of numerous stripper wells that have been shut in for several years. Most of these suspended wells are located in the San Joaquin Valley and especially in the Kern River, Midway-Sunset, Coalinga, and other similar fields.

Coastal District Wildcat

The most encouraging wildcat in California at the present time is 1 Ferguson which C. G. Willis is drilling in the Newhall-Potrero area of northwestern Los Angeles County. It is located about 1 mile southeast of productive properties of Barnsdall Oil Co. in the Newhall-Potrero field and would either prove up the intervening acreage to the advantage of Barnsdall Oil Co. or prove up a new field south of the present Newhall-Potrero field. To date the well log appears to be correlating about 50 ft. higher than Barnsdall's 14 Rancho San Francisco, a producing well in the Newhall-Potrero field.

Willis' new wildcat is in the upper Modelo of Miocene age and has cored the equivalent of the first Modelo zone that is moderately productive in the Newhall-Potrero field. First important showings were logged at 6,535-45 ft. and at the present depth a good oil sand has been found at 6,860 ft. At 6,775-95 ft. a core showed 14 ft. of good looking oil sand which carried good color and odor. The most productive Modelo zones in the Newhall-Potrero field, however, are beneath the present depth of 1 Ferguson. So far Barnsdall Oil Co. has not drilled a single dry hole in the Newhall-Potrero field.

COASTAL DISTRICT WILDCATS

Newhall wildcat district, Los Angeles County: Kenneth Oil Co. 1 Ray, 34-4n-15w, abandoned as dry hole; T.D. 2,202 ft., no important showings logged.

Tunnel Oil Co. 1 Needham, 13-3n-16w, abandoned as dry hole, T.D. 1,760 ft., no important showings logged.

Saticoy wildcat district, Ventura County: Shell 1 Saticoy, 21-3n-21w, abandoned in hard gray sand, T.D. 5,952 ft., no showings of oil or gas worth testing.

South Mountain, Ventura County: Loose & Dietzman 1 Lodie, 17-3n-20w, abandoned as off structure, T.D. 4,205 ft., only minor showings of oil and gas.

Exploration to Increase In San Joaquin Valley

It became quite evident last week that the San Joaquin Valley and perhaps the central part of the state will sustain the largest amount of prospecting work in the near future due to its enormous size and the vast expanse of untested land. Successful wildcat work which resulted in the discovery of Helm, Riverdale, Raisin City, and Jacalitos last year in Fresno County will probably lead to additional prospecting in this general area during 1942.

Raisin City Has Dry Hole

Barnsdall Oil Co. is pulling 7-in. casing in 1 Ripperdan in the Raisin City field of Fresno County following the failure to develop commercial production. This well, which is located west of production developed by Shell Oil Co., Inc., on a test of the Shell zone at 5,023-33 ft., recovered salt water. Tests of lower zones showed lack of fluid as the hole was bailed dry. Total depth of the well is 5,161 ft. Failure of this well to develop production proved a distinct disappointment as it was located close to production. During the current week, Shell swabbed 31-19 S.A.&F.L. dry with bottom at 5,077 ft. and the company is removing

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liner to make an open-hole test and clean out the well. Seaboard's last completion, 66-13 S.T.U. in 13-15s-17e, proved to be a gas well in the Shell gas zone after it failed to develop production in lower horizons.

SAN JOAQUIN VALLEY COMPLETIONS

Arvin, Kern County: Pacific Western Oil Co. 1 Houchin, 27-31s-29e, pumped 80 bbl., 20.2-gravity, 20 per cent cut, T.D. 7,409 ft., gun perf. 2 holes per ft. 7,225-80 ft., 7,285-7,315 ft., top oil sand streaks 7,222 ft., bottomed in gray sand.

Belridge South, Kern County: Ivy Drilling Co. 1 Belridge, 12-29s-21e, pumped 25 bbl., 13.3-gravity, 18 per cent cut, T.D. 1,138 ft., 120-mesh perf. 993-1,103 ft., completed in upper zone.

Edison, Kern County: Monterey Expl. Co. 1 Nazu, 22-30s-29e, pumped 15 bbl., 16-gravity, 50 per cent cut, T.D. 3,136 ft., P.B. 2,931 ft., perf. 2,788-2,930 ft., deepened from 2,960 ft., bottomed in granite, top granite basement 3,130 ft.

Wood-Callahan Oil Co. 6 Comm., 21-30s-29e, abandoned as dry hole, T.D. 3,664 ft., no important showings of oil or gas.

Jacalitos, Fresno County: Wilshire-Annex Oil Co. 21-26-E, 26-21s-15e, pumped 103 bbl., 40.1-gravity, 0.2 per cent cut, T.D. 3,713 ft., perf. 3,675-3,706 ft., top Temblor 3,675 ft., top porous oil sand 3,680 ft., base oil sand 3,704 ft., completed in Temblor oil sand of Miocene age.

Kettleman North Dome, Kings County: Standard 8-21-Q, 21-22s-18e, flowed 1,199 bbl., 38.5-gravity, 2 per cent cut, 550,000 cu. ft. gas, 38/64-in. bean, pressures 500/750 lb., T.D. 7,905 ft., perf. 7,311-99 ft., 7,449-92 ft., 7,533-92 ft., 7,830-7,904 ft., completed in Temblor formation of Miocene age.

Midway-Sunset, Kern County: Standard 89-11-D fee, 11-32s-24e, pumped 35 bbl., 26.7-gravity, 4 per cent cut, T.D. 2,705 ft., 60-mesh perf. 2,617-2,703 ft., completed in C zone of Etchegoin formation of Pliocene age.

Mount Poso, Kern County: Shell 4 Griffiths fee, 5-27s-28e, pumped 53 bbl., 15.1-gravity, 70 per cent cut, T.D. 1,835 ft., perf. 1,775-1,835 ft., completed in Vedder zone 7,750-7,835 ft., of Miocene age.

Vedder Pet. Co. 21-3 Lambert, 21-28s-28e, abandoned as dry hole, T.D. 1,601 ft., Vedder zone of Miocene age was gray and barren.

Round Mountain, Kern County: W. V. David 6 Olcese, 17-28s-29e, abandoned as dry hole, Vedder zone of Miocene age was gray and barren, T.D. 1,858 ft., no showings logged.

Selma wildcat district, Tulare County: W. E. Goble 1 Goble, 28-16s-23e, abandoned in hard brown shale, T.D. 1,975 ft., no showings logged.

Tipton wildcat district, Tulare County: Richfield 1 Hewitt, 1-21s-25e, abandoned in slate, T.D. 3,486 ft., top slate 3,475 ft., took sidewall samples but no oil sand found.

Los Angeles Permits Must Be Renewed Early

Renewal of fire permits for oil wells within the Los Angeles city limits for the year 1942 must be applied for not later than January 30, 1942, according to H. H. Story, secretary to the Board of Fire Commissioners. A municipal ordinance establishes the date for filing applications as February 1 but the commission's office will not be open Saturday or Sunday, January 31 and February 1, which terminates the filing period. The renewal fee is $25 per well excepting those in the old Los Angeles city field where the fee is $5 for each well.

Torrance and Wilmington Slow

M-68 and other kindred orders will probably put a damper on extensive drilling operations in Torrance and Wilmington in the Los Angeles Basin. It has been found that the Ranger or upper zone in the Wilmington field extends beyond the original Wilmington field and underlies a part of the Torrance field. For the past several months, operators have gradually extended the productive limits of the Torrance field by developing production in the equivalent of the Ranger zone.

LOS ANGELES BASIN COMPLETIONS

Coyote East, Orange County: Apex Pet. Co. 3 Dolicia, 23-3s-10w, abandoned as unproductive, T.D. 1,501 ft., mechanical trouble was a contributing factor.

Dominguez, Los Angeles County: Hiles-Crawford and associates 1 Willis, 29-3s-13w, abandoned as unproductive account water string cemented too high up in hole, T.D. 7,233 ft., abandoned in seventh Callender zone of Miocene age.

Union 78 Callender, 32-3s-13w, flowed 875 bbl., 31.4-gravity, 0.7 per cent cut, 2,475,000 cu. ft. gas, 76/64-in. bean, pressures 125/450 lb., T.D. 7,375 ft., perf. 6,820-7,372 ft., recompleted in seventh Callender zone of Miocene age; this well killed last year by earthquake.

Huntington Beach, Orange County: West American Oil Co. 10 Ashton, 34-5s-11w, pumped 125 bbl., 25.2-gravity, 1.5 per cent cut, T.D. 4,713 ft., cleaned out to 4,440 ft., perf. 4,100-35 ft., 4,225-54 ft., 4,266-80 ft., completed in lower Bolsa zone.

Inglewood, Los Angeles County: Associated 53 Vickers, 7-2s-14w, pumped 96 bbl., 17.1-gravity, 15 per cent cut, T.D. 3,080 ft., perf. 2,756-3,074 ft., recompleted in Investment zone of Pliocene age.

Bush Oil Co. 1 Merchants, 7-2s-14w, abandoned because Sentous zone of Miocene age was gray and wet, T.D. 8,871 ft.; this outpost located off structure.

Long Beach, Los Angeles County: Parry and associates 1 Signal, 28-4s-12w, abandoned as unproductive, T.D. 7,820 ft., minor showings of oil and gas.

Shell 1 White-Moser, 29-4s-12w, pumped 120 bbl., 27.4-gravity, 18 per cent cut, T.D. 3,550 ft., P.B. 3,320 ft., perf. 2,700-2,900 ft., 2,965-3,050 ft., 3,180-3,313 ft., completed in upper brown zone of Pliocene age.

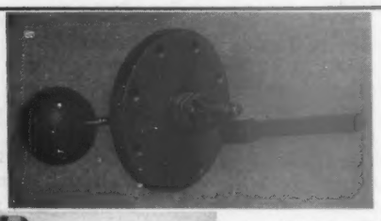
Torrance, Los Angeles County: Westport Oil Co. 7 W.P., 30-4s-13w, pumped 87 bbl., 16.2-gravity, 3 per cent cut, T.D. 3,761 ft., P.B. 3,734 ft., perf. 3,160-3,242 ft., 3,297-3,364 ft., 3,410-95 ft., 3,532-3,756 ft., completed in Torrance zone which is equivalent to Ranger zone at Wilmington.

Wilmington, Los Angeles County: Barnhart-Morrow Oil Co. 2 Sherman, 29-4s-13w, flowed 294 bbl., 17-gravity, 3 per cent cut, 37/64-in. bean, tubing pressure 100 lb., T.D. 3,715 ft., gravel-packed perf. 2,952-3,020 ft., 3,070-3,175 ft., 3,250-3,350 ft., 3,510-3,600 ft., 3,675-3,715 ft., completed in Ranger zone of Miocene age.

A. D. Mitchell 1 Breslin, 32-4s-13w, pumped 170 bbl., 17-gravity, 5 per cent cut, T.D. 3,710 ft., gravel-packed perf. 3,040-3,120 ft., 3,120-90 ft., 3,490-3,625 ft., 3,670-3,710 ft., completed in Ranger zone of Miocene age.

Union Pacific R. R. 214 fee, 3-5s-13w, flowed 966 bbl., 28.7-gravity, 1 per cent cut, 180,000 cu. ft. gas, 48/64-in. bean, pressures 420/1,000 lb., T.D. 3,525 ft., 60-mesh gravel-packed perf. 3,034-3,150 ft., 3,193-3,295 ft., 3,324-56 ft., 3,369-3,428 ft., 3,449-3,519 ft., completed in upper Terminal zone of Miocene age.

FOR TANK FLOAT CONTROL



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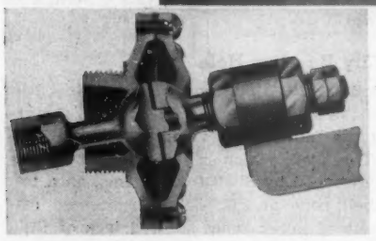

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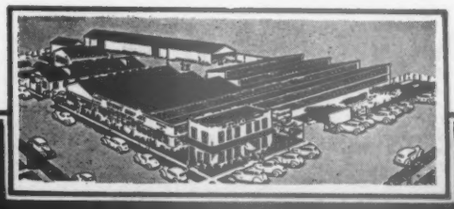

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Production Increases Despite Sharp Drop in Drilling

MATTOON, Ill.—Although Illinois oil exploration continued to decline during the past week, production showed a heavy gain with a reported daily average of nearly 368,000 bbl., compared to 337,500 bbl. daily for the previous week. From all producing areas in the state came reports of slackening activity as operators revised their drilling program to comply with the 40-acre spacing provision of federal drilling restrictions.

The effect of the restrictions on Hamilton County activity was typical of the trend throughout the state. It was believed that future development there would be reduced to 25 per cent of the activity prior to December 23, when the restrictions became effective. Throughout 1941, Hamilton vied with White and Wayne counties as the busiest in Illinois. White County activity has now been reduced more than 40 per cent and Wayne County's principal activity now is wildcat exploration which was not reduced by the federal regulations.

Operators Hope for Exceptions In Spacing Regulations

Most important oil news from the Illinois basin last week was the resumption of work by the Pure Oil Co., which has been idle for several weeks awaiting clarification of federal oil regulations restricting wells to 40-acre locations.

Pure Oil Co. apparently has the spacing problem solved, for after a visit to Washington by company executives from the Chicago and Olney offices it started drilling two wells which had been shut down since the regulations began, and applied for state drilling permits for four more wells, the locations being on 20-acre spacing and not the required 40-acre spacing. Although Pure's Chicago office denied that the four new 20-acre locations had been made, it is generally believed throughout the basin area that they actually were made and operators are hoping that an exception to the M-68 order of the OPM has been made in the Pure Oil case, despite the denial of the Chicago office. It is also hoped that such exceptions may be made in the case of all Illinois operations.

Shelby County Producer

Shelby County returned to the state's oil picture last week with a prospective producer west of Lakewood. The test, Luttrell 1 Horsman, SW SW NW 7-10n-3e, has set casing to test Aux Vases pay at 1,743 ft. with the hole bottomed at 1,749 ft. Some saturation was also encountered in the Benoist at 1,711-16 ft. but it was believed insufficient for commercial production.

Successful completion of the test, which was drilled on Carter Oil Co. farmout acreage is expected to revive development interest in the Lakewood area which has been favorably regarded despite the fact that several dry holes have been drilled around the village proper.

ILLINOIS COMPLETIONS

Wildcats

Clinton County: J. R. Anderson et al 1 L. Seiffert, SW SE SW 28-3n-2w, dry at 1,345 ft., Glen Dean 886 ft., Golconda 907 ft., Renault 1,246 ft., Ste. Genevieve 1,315 ft.

Edwards County: K. M. Menefee 2 McDowell, SW SE NE 31-1n-11e, pumped 20 bbl. oil and 100 bbl. water, Waltersburg sand 2,433 ft., T.D. 2,437½ ft.

Franklin County: Basin Drlg. 1 Dunkhamel, NE NW SW 30-6s-2e, dry at 2,836 ft., Menard 1,834 ft., Vienna 1,955 ft., Tar Springs sand 1,987 ft., Glen Dean 2,062 ft., Hardinsburg 2,117 ft., Golconda 2,174 ft., Barlow 2,320 ft., Cypress sand 2,350 ft., Renault 2,583 ft., Aux Vases 2,587 ft., Ste. Genevieve, 2,622 ft., Fredonia 2,697 ft., McClosky 2,740 ft., St. Louis 2,828 ft.

Fulton County: Lagers & Webb 1 Clear, SW NE NE 28-4n-2e, dry at 1,165 ft., Trenton 976 ft.

Jefferson County: Intra State Prod. 1 Heaton, SW NE SE 1-2s-1e, dry at 2,070½ ft., Glen Dean 1,652 ft., Benoist 2,065 ft.

Yingling & Mohawk 1 Fonts, SW SW NW 20-1s-1e, dry at 2,374 ft., base Pennsylvanian 1,490 ft., Menard 1,495 ft., Tar Springs sand 1,559 ft., Glen Dean 1,684 ft., Hardinsburg 1,698 ft., Golconda 1,760 ft., Barlow 1,870 ft., Cypress sand 1,882 ft., Benoist 2,039 ft., Benoist sand 2,041 ft., Aux Vases 2,100 ft., Ste. Genevieve 2,207 ft., Rosiclare 2,223 ft., Fredonia 2,249 ft., McClosky 2,256 ft., St. Louis 2,370 ft.

Lawrence County: V. Youngblood 1 Philbert, S½ SE SE 33-4n-11w, dry at 2,000 ft., Ste. Genevieve 1,764 ft., McClosky 1,794 ft., St. Louis 1,882 ft.

Washington County: Hamley et al 1 Walthes, NW SW SE 6-1s-5w, dry at 1,002 ft., base Pennsylvanian 706 ft., Ste. Genevieve 955 ft., Fredonia 980 ft.

J. A. Brouk 1 Kozuszek, NE NE SE 20-3s-2w, dry at 1,362 ft., Menard 782 ft., Waltersburg 818 ft., Tar Springs sand 868 ft., Glen Dean 963 ft., Hardinsburg sand 1,022 ft., Golconda 1,034 ft., Barlow 1,126 ft., Cypress sand 1,202 ft., Benoist 1,320 ft.

Fotiades 1 Long et al, SW SE NW 35-2s-1w, dry at 1,806 ft., Glen Dean 1,185 ft., Benoist 1,549 ft., Rosiclare 1,740 ft., McClosky 1,790 ft.

Wayne County: O'Shaughnessy 1 Withraw, N½ NE NW 21-1s-6e, dry at 3,230 ft., Glen Dean 2,563 ft., Golconda 2,651 ft., Barlow 2,752 ft., Cypress sand 2,788 ft., Paint Creek sand 2,932 ft., Benoist 2,990 ft., Renault 3,036 ft., Aux Vases 3,065 ft., Ste. Genevieve 3,112 ft., Levias 3,122 ft., Fredonia 3,170 ft., McClosky 3,176 ft.

White County: Stilley & Hampton 1 E. Ramming, SE SE SE 17-4s-9e, dry at 3,440 ft., lower Kincaid 2,218 ft., Menard 2,460 ft., Vienna 2,583 ft., Tar Springs sand 2,603 ft., Glen Dean 2,708 ft., Hardinsburg 2,768 ft., Golconda 2,822 ft., Barlow 2,939 ft., Paint Creek 3,082 ft., Benoist 3,122 ft., Renault 3,173 ft., Aux Vases 3,252 ft., Ste. Genevieve 3,283 ft.

Fields

Alma, Marion County: Texas 1 J. Mazanek, NW NW SW 36-4n-2e, pumped 15 bbl. oil and 3 bbl. water, natural, Benoist 1,930-42 ft., T.D. 2,126 ft., P.B. 1,940 ft.

Bone Gap, Edwards County: Helmerich & Payne 1 Reid, SW NE NW 18-1s-11e, pumped 100 bbl. oil and 5 bbl. water, 1,000 gal. acid, McClosky 3,186-3,201 ft., T.D. 3,202 ft.

Boyleston, Wayne County: H. H. Weinert 5-B Morlain, SE NE NW 33-2s-7e, pumped 40 bbl., 5,000 gal. acid, McClosky 3,300-20 ft., T.D. 4,140 ft.

East Centerville, White County: Skelly 2 Bryant, N½ SE SW 7-4s-10e, pumped 468 bbl., 1,500 gal. acid, McClosky 3,237-46 ft., T.D. 3,246 ft.

Dundas, Jasper County: Pure 2-A C. M. Honey, E½ NW NE 17-5n-10e, pumped 28 bbl., 5,000 gal. acid, McClosky 2,774-78 ft., 2,788-94 ft., T.D. 2,820 ft.

Pure 3 S. A. Beavers, E½ NW NE 18-5n-10e, pumped 173 bbl., 5,000 gal. acid, McClosky 2,838-43 ft., T.D. 2,865 ft.

Hoodville, Hamilton County: Texas 12 R. R. Johnson, SE NE NE 13-6s-6e, pumped 58 bbl. oil and 20 bbl. water, 10-qt. shot 3,103-10 ft., Aux Vases 3,089 ft., T.D. 3,112 ft., P.B. 3,110 ft.

Iron, White County: Brisch 1-B J. Bolerjack, NE NE NE 23-6s-8e, pumped 5 bbl. oil and 25 bbl. water, 30-qt. shot 2,784-94 ft., 10-qt. shot 2,784-90 ft., Benoist 2,785 ft., T.D. 3,099 ft., P.B. 2,885 ft.

Johnsonville, Wayne County: Texas 1 Bullard, S½ SW NW 23-1n-6e, pumped 16 bbl. oil and 25 bbl. water, 4,000 gal. acid, McClosky 3,194-97 ft., T.D. 3,200 ft.

Wiser Oil 2 I. Matchett, W½ SE SE 27-1n-6e, pumped 124 bbl., 10-qt. shot 2,941-46 ft., Aux Vases 2,936 ft., T.D. 2,946 ft.

United Prod. 8 Cariens, W½ SW NE 34-1n-6e, pumped 150 bbl., 40-qt. shot 2,970-85 ft., Aux Vases sand 2,968 ft., T.D. 2,990 ft.

United Prod. 3 Schofield, W½ SE SE 34-1n-6e, pumped 300 bbl., 20-qt. shot 3,031-37 ft., Aux Vases 3,030 ft., T.D. 3,042 ft.

Shell 1-B Cisne Bank, E½ SW NE 36-1n-6e, pumped 217 bbl., perf. 3,214-17 ft., 3,210-20 ft., 3,196-3,204 ft., 1,500 gal. acid, 15-qt. shot 3,078-88 ft., Aux Vases 3,071-90 ft., Levias 3,199-3,202 ft., T.D. 3,269 ft., P.B. 3,231 ft.

Wiser Oil 1 M. Schell, W½ SE NE 36-1n-6e, pumped 125 bbl, 40-qt. shot 3,073-93 ft., perf. 3,192-95 ft., 3,205-13 ft., 3,242-50 ft., 5,000 gal. acid, Aux Vases 3,074 ft., McClosky 3,192 ft., T.D. 3,256 ft.

Louden, Fayette County: Carter 1 Steele, SW NW SW 6-8n-4e, dry at 1,525 ft., Glen Dean 1,346 ft., Cypress sand 1,510 ft.

Carter 3-D O. C. Wood, NE NW 11-8n-3e, pumped 100 bbl. oil and 4 bbl. water, natural, Devonian 3,051 ft., pay 3,133 ft., T.D. 3,139 ft.

Vetsch & Thompson 1 Eagleton, SE NW SW 20-8n-3e, pumped 66 bbl., 20-qt. shot 1,528-36 ft., Cypress 1,501 ft., T.D. 1,540 ft.

Maunie, South, White County: Yingling 4 H. Karch, NE SE SW 13-6s-10e, pumped 118 bbl, 20-qt. shot 2,010-18 ft., Palestine 2,009-33 ft., T.D. 2,914 ft., P.B. 2,022 ft.

Mount Carmel, Wabash County: Hayes Drlg. 5 Cotner, SE SW NE NW 21-1s-12w, pumped 125 bbl., 40-qt. shot 1,995-2,009 ft., Cypress 1,995-2,009 ft., T.D. 2,318 ft., P.B. 2,010 ft.

Hayes Drlg. 6 Cotner, SE NW NE NW 21-1s-12w, pumped 140 bbl., 40-qt. shot on bottom, Cypress sand 1,990-2,005 ft., T.D. 2,005 ft.

Dean & Morton 2 Sanford, SE SE SE NW 21-1s-12w, pumped 100 bbl., 50-qt. shot 1,980-2,002 ft., T.D. 2,303 ft., old well worked over.

New Harmony, White County: Superior 31 E. M. Fitton, SW NW NW 23-4s-14w, pumped 20 bbl. oil and 80 bbl. water, perf. 2,652-64 ft., Cypress sand 2,652 ft., T.D. 2,895 ft., P.B. 2,702 ft.

Superior 36 E. M. Fitton, NW NE SW 23-4s-14w, pumped 178 bbl., 160-qt. shot 2,843-80 ft., 5-qt. shot 2,875-80 ft., Aux Vases 2,843-68 ft., T.D. 2,880 ft.

Sun 38 E. R. Greathouse, NE SW SE 33-4s-14w, pumped 110 bbl., 20-qt. shot 2,698-2,708 ft., Benoist 2,656 ft., T.D. 2,730 ft.

Parkersburg, Edwards County: Bander & Martin 2 L. C. Wells, S½ SW NE 31-2n-14w, pumped 168 bbl. oil and 70 bbl. water, 2,000 gal. acid, McClosky 3,139-44 ft., T.D. 3,145 ft.

Roland, White County: N. V. Duncan 2 Winfrey Comm., NW NE NE 11-7s-8e, pumped 165 bbl. in 17 hr., 30-qt. shot 2,748-69 ft., 40-qt. shot 2,911-21 ft., Benoist 2,744 ft., Aux Vases 2,889 ft., T.D. 2,927 ft.

Superior 1 Rainey, SE NE SE 2-7s-8e, flowed 87 bbl., 20-qt. shot 2,767-81 ft., perf. 2,233-44 ft., Waltersburg sand 2,234-43 ft., Benoist 2,751-70 ft., T.D. 2,785 ft., P.B. 2,781 ft.

Rural Hill, Hamilton County: Whisenant & Trenchard 8 J. Lockwood, SE SE NE 23-6s-5e, dry at 3,174 ft., Glen Dean 2,503 ft., Barlow 2,783 ft., Cypress sand 2,836 ft., Benoist 2,966 ft., Renault 3,063 ft., Aux Vases 3,093 ft., Ste. Genevieve 3,118 ft., McClosky 3,152 ft.

Pure 1 J. A. Cox, SE NE SE 12-6s-5e, pumped 434 bbl., perf. 3,155-65 ft., 3,000 gal. acid, perf. 3,050-80 ft., Aux Vases 3,064-93 ft., Rosiclare 3,160-64 ft., T.D. 3,313 ft.

Schoenfeldt et al 6 Hamilton, SE NW SE 13-6s-5e, swabbed 300 bbl., 40-qt. shot 3,135-56 ft., Aux Vases 3,128-64 ft., T.D. 3,166 ft.

Shell 4-B J. F. Crabtree, SE SW SW 13-6s-5e, flowed 490 bbl. oil and 38 bbl. water, 15-qt. shot 3,136-46 ft., Aux Vases 3,116-48 ft., T.D. 3,370 ft., P.B. 3,146 ft.

Shell 3 J. Nohava, NE SW NE 13-6s-5e, flowed 83 bbl. oil and 2 bbl. water, 15-qt. shot 3,126-36 ft., Aux Vases 3,122-36 ft., T.D. 3,341 ft.

Shell 4 Smith, NE SE NE 13-6s-5e, flowed 594 bbl. oil and 2 bbl. water in 16 hr., Aux Vases 3,140 ft., McClosky 3,317-41 ft., 3,363-70 ft., Levias 3,213-18 ft.

Kewanee Oil 3 Culpepper, SE SW SE 14-6s-5e, flowed 200 bbl., 80-qt. shot 3,078-5,105 ft., Aux Vases 3,072-3,109 ft., T.D. 3,111 ft.

Kewanee 5 Culpepper, NE SW SE 14-6s-5e, perf., 1,500 gal. acid, Levias 3,164-79 ft., 3,235-38 ft., T.D. 3,369 ft.

Superior 1 F. Darnell, NE NE NE 22-6s-5e, pumped 90 bbl., 60-qt. shot 3,186-73 ft., 190-qt. shot 3,168-86 ft., 800-qt. shot 3,168-86 ft., Aux Vases 3,160-72 ft., T.D. 3,187 ft.

Superior 2 F. Darnell, NW NE NE 22-6s-5e, pumped 185 bbl. in 16 hr., 140-qt. shot 3,155-85 ft., Aux Vases sand 3,159-79 ft., T.D. 3,186 ft.

Shell 3-B J. F. Crabtree, NW NE NE 23-6s-5e, flowed 375 bbl. oil and 14 bbl. water, 20-qt. shot 3,085-99 ft., Aux Vases 3,075 ft., T.D. 3,351 ft., P.B. 3,150 ft.

Russellville, Lawrence County: Kentucky Nat. Gas 6 J. H. Prather, NE NW SE 18-4n-10w, 1,900,000 cu. ft. gas, pay 785-807 ft., T.D. 807 ft.

Sailor Springs, Clay County: W. C. McBride 1 P. Erwin, SW NW SE 34-4n-7e, dry at 3,112 ft., Menard 2,218 ft., Glen Dean 2,424 ft., Barlow 2,574 ft., Ste. Genevieve 2,930 ft., McClosky 3,079 ft.

St. Francisville, East, Lawrence County: Sinclair et al 5 Allstates Life, S½ SW NW NE 22-2n-11w, pumped 47 bbl., natural, Benoist 1,739 ft., T.D. 1,766 ft.

Salem, Marion County: Texas 7 O. Hopkins, NW NE SE 31-2n-2e, flowed 109 bbl., natural, Trenton 4,461 ft., pay 4,555-63 ft., old well deepened from 3,341-4,588 ft.

Simms, Wayne County: Texas 2 H. O. Fuhrer, W½ SW SE 28-1s-6e, pumped 30 bbl., perf. 3,074-79 ft., 3,142-50 ft., 3,000 gal. acid, 20-qt. shot 3,010-20 ft., Aux Vases sand 3,010-36 ft., McClosky 3,132-36 ft., 3,142-50 ft., T.D. 3,185 ft.

Stringtown, Richland County: Olson Drlg. 1-A Nuding, S½ NE NE 6-4n-11e, pumped 33 bbl. oil and 90 bbl. water, 5,000 gal. acid, McClosky pay 3,044-52 ft., T.D. 3,055 ft.

West Centralia, Clinton County: J. J. Broadus 2 Geary heirs, NW NE SW 14-1n-1w, pumped 40 bbl., 10-qt. shot 1,431-40 ft., T.D. 1,440 ft.

Woodlawn, Jefferson County: Skelly 1 Woodlawn Bank, NW NE SW 1-3s-1e, pumped 141 bbl., 20-qt. shot 1,973-81 ft., Benoist 1,974-81 ft., T.D. 1,981 ft.

Martin et al 2 Rosenberg, NE NE NW 35-2s-1e, pumped 96 bbl., 10-qt. shot 2,013-17 ft., Benoist sand 2,005 ft., T.D. 2,017 ft.

Shell 6 Burkhart, SW NW NE 35-2s-1e, pumped 144 bbl. oil and 6 bbl. water, 10-qt. shot 2,002-09 ft., Benoist sand 1,990 ft., T.D. 2,273 ft., P.B. 2,021 ft.

APPALACHIAN FIELDS

Operators Ready to Drill When M-68 Is Clarified

PITTSBURGH, Pa.—Operations continued at a reduced rate during the past week in the lower eastern fields. While many new locations were on file and others were made out, all were being held up under OPM M-68 until some clarifying order or modification could be issued.

On the Fayette anticline in South Huntington Township, Fayette County, Peoples Natural Gas Co. drilled to 7,521 ft. in the test on the Jacobs Creek Oil Co. and there was shut down with a fishing job. This depth is 184 ft. below the top of the Onondaga lime and the Oriskany sand should be near.

On Chestnut Ridge in South Union Township, New Penn Development Co., William E. Snee, et al drilled out the cement in No. 4 Heyn (Summit Hotel) after casing had been set at 6,511 ft. and struck the first gas in the Onondaga chert beds. The well has been shut down testing casing. Here this company is running casing in the test on the Kirby heirs after cementing on account of a crooked hole and redrilling to 6,305 ft. A smaller hole will now be carried.

Here Greensboro Gas Co. continued drilling 1 Barton estate running a daylight tour only and making little headway against the gas volume which has been as high as 2,500,000 cu. ft. from 7,248 ft. Peoples Natural Gas Co. is drilling at 7,928 ft. in 4 Piedmont Coal Co. with the Lower Devonian still not in evidence.

On the Washington anticline in Richhill Township, Greene County, Natural Gas Co. of West Virginia is fishing at 6,707 ft. in the wildcat on the Andrew Workman farm. After a gas pocket at 6,538 ft. and the tools lost, the tools were bypassed and at the present depth another gas blowout from the shales again caused a fishing job. In Beaver County, St. Joseph Lead Co. is fishing the bailer at 5,144 ft. in the wildcat on the J. P. Koehler heirs in Center Township.

Greene County, Morris Township: Carnegie Natural Gas Co. 2 Mason Leightner, 18,000 cu. ft. gas; Gantz sand 2,918-43 ft., gas 2,932-33 ft., T.D. 3,319 ft.

Wayne Township: Charles Orndoff et al 2 Peter Yeager, 249,000 cu. ft. gas; Bayard sand 3,352 ft., gas 3,353 ft., T.D. 3,402 ft.

Washington County, Somerset Township: Manufacturers Light & Heat Co. 1 C. W. Winnett, 311,000 cu. ft. gas; Gordon sand 2,679 ft., gas 2,679 ft., T.D. 2,680 ft.

William Hess et al 3 J. M. and Boyd Paden, 490,000 cu. ft. gas; Big Injun sand 1,462 ft., gas 1,520 ft., T.D. 1,528 ft.

Westmoreland County, Bell Township: Peoples Natural Gas Co. 2 Westmoreland Mining Co., 98,000 cu. ft. gas; Bradford sand 3,437-67 ft., gas 3,442 ft., T.D. 3,557 ft.; will shoot.

WEST VIRGINIA COMPLETIONS

Boone County, Peytona district: Owens, Libby-Owens Gas Dept. 18 Bull Creek Coal Land Co., 179,000 cu. ft. gas; Big lime 1,100-1,273 ft., Injun 1,273-1,312 ft., Berea 1,736-42 ft., brown shale 3,244-74 ft., 3,329-3,524 ft., 3,977-4,290 ft., Corniferous lime 4,290 ft., Oriskany 4,379 ft., T.D. 4,409 ft., R.P. 1,000 lb.

Scott district: Hope Natural Gas Co. 8577 Chambers & Stowers, 160,000 cu. ft. gas, Big lime 1,177-1,350 ft., Injun 1,350-95 ft., Berea 1,848-74 ft., R.P. pressure 260 lb. 48 hr.; T.D. 1,900 ft.

Sherman district: Pure Oil Co. 43 La Follette, Robson & Pritchard, 126,240 ft., Weir sand, T.D. 3,327 ft.

Clay County, Buffalo district: Pittsburgh & West Virginia Gas Co. 7840 Ida B. Wilson, 69,930 cu. ft. gas, Big lime 1,968-2,235 ft., T.D. 2,351 ft.; will shoot.

Lincoln County, Harts Creek district: Hope Natural Gas Co. 8578 R. E. Chapman, 160,000 cu. ft. gas, Big lime 1,550-1,750 ft., Injun 1,750-1,810 ft., Berea 2,256-83 ft., R.P. 470 lb., 48 hr., T.D. 2,302 ft.

Roane County, Harper district: American Oil Development Co. 2 Howard Riley, 4 bbl., salt sand, T.D. 1,840 ft.

Lincoln County, Jefferson district: Jefferson Gas Co. 2 Richard Miller, 189,000 cu. ft. gas; Big lime 1,576-1,765 ft., Injun 1,765-80 ft., Berea 2,270-97 ft., brown shale 3,538-3,695 ft., 3,710-3,826 ft.; T.D. 3,826 ft.

ORISKANY COMPLETIONS

Jackson County, Ravenswood district: Haye Oil & Gas 2 Estil Hill, 112,000 cu. ft. gas after shot (abandoned) Corniferous lime 4,820 ft., Oriskany 4,934 ft., shot 4,926-66 ft., T.D. 4,986 ft.

Ripley district: Columbian Carbon Co. 1 W. A. Carney, 14,673,000 cu. ft. gas; Corniferous lime 5,058 ft.; Oriskany 5,168 ft., shot 5,168-5,208 ft., R.P. 1,740 lb., 96 hr.; T.D. 5,259 ft.

Columbian Carbon Co. 1 B. F. Weekley, 381,000 cu. ft. gas before shot; Corniferous lime 4,880 ft., Oriskany 5,005 ft., T.D. 5,089 ft.

G. L. Cabot, Inc. 13 J. L. McLean heirs, 1,917,000 cu. ft.; Salt sand 1,554 ft., gas 1,558-68 ft., T.D. 1,566 ft.

Kansas Fields

(Continued from Page 214)

Champlin 3 Grant, N½ NW NW 20-20-11w, potential 75 bbl., Arbuckle 3,297-3,311 ft.

Vaughn, Russell County: Cities Service 2 Vaughn, SE SW SW 17-14-14w, old well, Lansing 3,013-97 ft., T.D. 3,097 ft., potential 347 ft.

East Wherry, Rice County: Carl Hipple 1 Pallister, NW SW SE 12-21-7w, potential 225 bbl., conglomerate 3,434-41 ft.

Zenith, Stafford County: Hall & Landon 2 Porter, E½ SW SE 7-24-10w, potential 235 bbl., Viola 3,720-16 ft., T.D. 3,774 ft.

Zyba, Sumner County: Waite Phillips 1 Sprout, NE NE NE 13-30-1w, potential 214 bbl., Simpson 3,854 ft., T.D. 3,858½ ft.

Miscellaneous, Greenwood County: N. C. Dunn 3 Dawson, W½ W½ SE 22-26-13e, pumped 8 bbl., Bartlesville 1,450-64 ft.

Eighth Well Completed In Nebraska Pool

ST. JOSEPH, Mo.—Skelly Oil Co.'s eighth well in the Barada pool of Richardson County, Nebraska, is 1 Zimmerman, which was drilled at the south end of the pool. There was no announcement of potential production, but in 2 hours and 40 minutes the hole filled 1,980 ft. with oil. Skelly 1 Mary Mack, at the north end of the pool, also was showing satisfactorily and pipe was cemented for a test.

NEBRASKA COMPLETIONS

Dawson, Richardson County: A. H. Kruger 1 Ogle, E½ NE SE 9-1n-14e, Hunton 2,245 ft., T.D. 2,300 ft., 200 bbl. oil per day (est.).

Barada, Richardson County: O. C. Johnson and Dan Short 1 Henry Horn, E½ NE SW 26-3n-16e, dry hole.

Skelly 1 Zimmerman, W½ SE SW 36-3n-16e, Hunton 2,454 ft., T.D. 2,508 ft., 1,980 ft. oil in 2 hr. 40 min., completed.

An Elliott 197-hp. turbine driving three pumps in tandem, in a natural gasoline plant. There are several similar tandem drives in this plant.

THE PLANT SUPERINTENDENT insisted—

said that when it comes to turbines, proven performance counted more than competitive bids. Pointed out that it was his job to keep the plant going and show a profit, and he wanted nothing but Elliott turbines on his pump drives . . . He got them, too — and so in this natural gasoline plant, eight important pump drives are being handled by sturdy Elliott turbines, to the satisfaction of all concerned.

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ROCKY MOUNTAIN AREA

Deep Test Is Scheduled For Northwest New Mexico

By T. R. INGRAM

DENVER, Colo.—Moderation of weather conditions resulted in a resumption of drilling in most of the fields in the Rocky Mountain area. The Southern Union Production Co. 1 Ute Indian lease, NE NW 21-32n-14w, Barker dome, Northwest New Mexico, near the Colorado line, had a flow of gas estimated at 9,000,000 cu. ft. in the upper part of the Dakota sand, but upon drilling deeper picked up some water. Total depth is 2,490 ft. It will plug back and complete and is expected to make around 5,000,000 cu. ft.

This well is on a lease of 4,960 acres which the company purchased last September at auction. The well is approximately a mile to the southwest of the only other well drilled on the structure, a test put down in 1924 by the Gypsy Oil Co., which had 30,000,000 cu. ft. in the Dakota, but which subsequently was abandoned. The acquisition of this lease assures Southern Union of ample supplies for its trunk line system into Durango, Colo., and southeast to Albuquerque, N. M.

Continental Oil Co. will drill another deep test to the Pennsylvanian this spring on the Rattlesnake dome, San Juan County, New Mexico. Location has not yet been released. Last June the company acquired at an auction sale an Indian lease on 3,720 acres adjoining its present holdings following an extensive geophysical and geological survey, and the new test will be on this block which lies to the south, southeast and southwest of the present holdings. The field is operated entirely by Continental, the principal production coming from the Dakota at shallow depth. Several deep wells encountered oil, and were on production for a time, but subsequently were abandoned.

Eastern Colorado Oil Show

The O. E. Terry wildcat in Cheyenne County, Colorado, 1 Whitson, NW NW SE 12-13s-49w, is ready to test show of oil in lime at 4,810-12 ft. before drilling into the pay. It was drilled to this depth with rotary and now has changed over to cable tools and bailing down is expected to begin today.

Elk Basin Gets Test

Another fault-block test in the South Elk Basin district is to be drilled to the Dakota at Minnelusa Oil 4-H-10 Tip 2, C NE NE 31-58n-99w. This is an old well which produced from the Wall Creek at 1,875 ft., total depth and will be deepened. It is located about midway between the Mackinnie well in Section 5 which recently discovered gas in the Dakota and the Dakota sand gas wells in the field proper. The series of fault-blocks running southeast from the field cover an area as great in extent as the field which has been a light oil producer for years.

Proration Begins

All of the Rocky Mountain states were taking stock of their production and markets last week as steps were taken by the governors of Colorado, Wyoming and Montana to keep production down to the rate recommended by the Office of Petroleum Coordinator. None have ever operated under proration before (see p. 58).

WYOMING COMPLETIONS

Cole Creek field, Natrona County: General Petroleum 3-21-G, NW SW NW 21-35n-77w, T.D. 4,596 ft., top of Shannon sand 4,564 ft., pumped 120 bbl. first 24 hr.

Lost Soldier field, Sweetwater County: Sinclair-Wyoming 8 Hughes, SW SW SW 2-26n-90w, T.D. 4,456 ft., top Tensleep 4,084 ft., 7-in. 4,074 ft., swabbed 247 bbl. in 12 hr. through tubing. Outpost well one location north of production.

MONTANA COMPLETIONS

Cat Creek field, Garfield County: H. H. Schwartz Jr. No. 1, SW SW NW 26-15n-30e, T.D. 1,113 ft., first Cat Creek sand 1,131-33 ft., water, plugged and abandoned.

Cut Bank field, Glacier County: Texas 4-A Government, CWL SE SW 17-32n-5w, T.D. 2,790 ft., 7-in. 2,767 ft., Cut Bank sand 2,765-89 ft., main pay 2,769-89 ft., swabbed 225 bbl. first 22 hr.

Bowdoin field, Phillips-Valley counties: Montana-Dakota Utilities 652 Matthews, C SE SE 3-31n-34e, T.D. 850 ft., top Bowdoin sand 755 ft., 278,000 cu. ft., 185 lb. pressure.

Montana-Dakota 658 Federal Land Bank, C SW SE 1-31n-34e, T.D. 860 ft., Bowdoin sand 760-840 ft., 627,000 cu. ft., 220 lb. pressure.

Montana-Dakota Utilities 662 Bell, C Lot 3, 4-31n-34e, T.D. 875 ft., Bowdoin sand 765-85 ft., 297,000 cu. ft., 185 lb. pressure.

Montana-Dakota Utilities 667 Reilly, C NW SE 26-32n-33e, Bowdoin sand 710-90 ft., 295,000 cu. ft., 220 lb. pressure.

Montana-Dakota Utilities 670 Wilde, C NE NW 19-31n-34e, T.D. 1,027 ft., P.B. to Bowdoin sand 910-70 ft., 1,035,000 cu. ft.

Kevin-Sunburst field, Toole County: Montana Exploration 1 Lashbaugh, SE NE NW 34-35n-3w, T.D. 1,616 ft., contact 1,500-02 ft., acidized in lime without results, abandoned.

Big West Oil 1 State, C SE 6-34n-4w, T.D. 2,154 ft., 7-in. 2,106 ft., Sunburst 2,090-2,125 ft., est. 1,000,000 cu. ft., Cut Bank 2,140-54 ft., open flow gage 2,125,000 cu. ft.

NORTHWEST NEW MEXICO COMPLETIONS

Hospah field, McKinley County: Petroleum Products 24 Hospah, NW SW NE 1-17n-9w, T.D. 1,560 ft., 25 bbl. first 24 hr. on pump from Hospah sand.

COLORADO COMPLETIONS

Wildcats

Kiowa County: Stanolind 1 Snell, SE 7-20-41w, dry at 5,994 ft., elev. 3,853 ft., Cherokee shale 4,510 ft., Mississippi lime 5,060 ft., Viola 5,785 ft., Arbuckle 5,920 ft.

ANNUAL REVIEW OUTLOOK

This review issue of The Oil and Gas Journal would be incomplete without the reminder that in 1941 many additional producers convinced themselves experience DOES count—that it pays to buy pumping units made by the oldest and largest exclusive manufacturer in that important field.

We expect an even larger demand for JENSEN UNITS this year, because the necessity for economy and efficiency is greater. Men buy more carefully in lean years, and in years when government exacts a heavy toll from income.

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Indiana Test Showing Pennsylvanian Pay

EVANSVILLE, Ind.—Mo-Jo Oil Co. 1 Revis Dugan, SE SE NW 35-2s-9w, Gibson County, about 2 miles south and 1 mile west of Oakland City, is showing for a producer in the Pennsylvanian sand at 1,067-74 ft. In 15 hours about 33 bbl. of oil rose in the hole after the pay section was drilled. The test will be given a shot of nitroglycerin before completion.

Nearest production is more than 1 mile to the north where there are a few wells producing from the Oakland City sand.

Another probable producer in Gibson County is Roy Benoist 1 Adolphus Dunn, W½ SE SW 24-1n-10w, an east outpost to the Hazleton field. It is expected to make a 75-100-bbl. producer. Total depth is 1,778 ft.

Ru-Mar Drlg. 1 G. Morelock, NW SE NW 26-7s-14w, Posey County wildcat 3½ miles south of the Mount Vernon field, has been abandoned at a total depth of 2,386 ft. through the Cypress sand. No. 1 Morelock encountered some saturation in the Cypress and at first was expected to make a producer.

Rig Skidded After Fishing Job at Lordstown Test

ZANESVILLE, Ohio.—In northeastern Ohio, Trumbull County, at Lordstown, the Magnolia Petroleum Co. was skidding rig on their wildcat test, on 1 D. Giovannone, Lot 20, after an unsuccessful attempt to recover 8-in. casing dropped in the hole at 3,500 ft.

The Hinckley pool in Medina County reported fair gas wells gaging 1,500,000 cu. ft. gas each.

OHIO COMPLETIONS

Ashland County, Perry Township: Ohio Fuel 1 E. W. Firestone, Sec. 3, dry, Clinton, T.D. 2,963 ft.
Auglaize County, Union Township: N. E. Masters 1 J. C. Miller, Sec. 22, dry, Trenton 1,400-34 ft.
Licking County, Bowling Green Township: Fred W. Abbott et al 2 Currie Caldwell, NE Sec. 2, 40 bbl., swabbed 24 hr., Clinton sand, T.D. 3,060 ft.
Mary Ann Township: J. R. Shannon et al 7 P. F. Shannon, Sec. 15, 2-bbl. pumper, Berea, T.D. 731 ft.
Lorain County, Ridgeville Township: Edson & Sons 1 J. Johnson, Lot 32, dry, Clinton, T.D. 2,455 ft.
Medina County, Blackley Township: H. C. Bishop 1 Mary Lisy, Sec. 35, 15 bbl. before shot, Little lime, T.D. 3,096 ft., may be deepened to the Clinton.
Hinckley Township: Ohio Fuel 1 Earl Kellogg, Lot 49, 1,560,000 cu. ft. gas, shot, Clinton, T.D. 3,582 ft.
Harry Dempsey 1 J. Haas, Lot 53, 1,500,000 cu. ft. gas, shot, Clinton, T.D. 3,370 ft.
Meigs County, Rutland Township: Ohio Fuel 2 L. Rumfield, Fraction 33, 220,000 cu. ft. gas, second Cow Run, T.D. 605 ft.
Monroe County, Franklin Township: Hague Gas Co. 4 Ross Hines, Sec. 36, 230,000 cu. ft. gas, second Cow Run, T.D. 650 ft.
Muskingum County, Blue Rock Township: Industrial Gas Corp. 1 Rufus M. Gandee, SW Sec. 4, 500,000 cu. ft. gas, Medina, T.D. 4,285 ft.
Newton Township: Atha Co. 3 D. H. Thompson, Sec. 18, 15-bbl. shot, Clinton 3,370-3,415 ft., T.D. 3,580 ft.
Noble County, Noble Township: Fassett Oil Co. 9 John Hayes, Sec. 34, dry, Maxburg 300 ft., T.D. 255 ft.
Perry County, Clayton Township: Preston Oil Co., Ernest F. Smitlet farm, NE Sec. 7, 92 bbl. oil and 50,000 cu. ft. gas, Clinton sand, T.D. 3,190 ft.
Stark County, Lake Township: Brendel Prod. Co. 1 S. J. Hoover, Sec. 28, dry, Clinton, T.D. 4,685 ft.
Tuscarawas County, Fairfield Township: Brendel Prod. Co. 2 Boy Scouts of America, Sec. 6, 500,000 cu. ft. gas, shot, Clinton, T.D. 4,990 ft.
Washington County, Ludlow Township: Hall Farm Oil & Gas Co. 3 Henry E. Hall, NW Sec. 28, 600,000 cu. ft. gas, Germantown sand, T.D. 1,106 ft.
Wood County, Liberty Township: Nelson Pember 1 T. A. Shaw, Sec. 1, 80-bbl. shot, Trenton 1,314-49 ft., pay 1,322-47 ft. (W of Signet).

Reports Not Being Issued on Eastern Kentucky Operations

ASHLAND, Ky.—One gas well was reported completed in eastern Kentucky last week but information on other drilling activities in this part of the state is not available.

The Inland Gas Corp. completed No. 229 on the Ben J. Slone tract on the Left Fork of Troublesome Creek in Knott County at a total depth of 3,170 ft. The well has an open flow of 146,000 cu. ft. of gas daily from White Slate. Inland officials were silent on future drilling plans.

This same silence marks other usual information sources as firms in this section await clarification of federal orders regarding drilling operations. Application of the new federal order to the eastern Kentucky drilling activities may slow the steady expansion which has marked various programs in recent months.

WESTERN KENTUCKY COMPLETIONS

Hancock County, Pellville district: O. D. Vickers et al 2 E. F. Baize, dry hole, T.D. 674 ft.
Henderson County, Niagara district: Schneider & Guinn 1 A. Robards, 5 bbl., 20-qt. shot, Pennsylvanian sand 695-705 ft.
Ohio County, Sunnydale district: DeHart 5 J. W. Wedding, dry hole, T.D. 485 ft.

Scouts Reorganize Districts To Reduce Rubber Use

In an attempt to save rubber, oil scouts of Oklahoma and Kansas have elected to: (1) Eliminate the Enid, Okla., check meeting, leaving only the Ardmore and Shawnee checks; (2) consolidate several districts to cut field trips approximately one-half; (3) reduce the scouting of geophysical parties, leasing activity and pipe lines; (4) drop Wagoner and Muskogee counties from the Oklahoma check.

Wisconsin Heavy-Duty Air-Cooled Engines are supplied in a full range of sizes from 1 to 35 hp., in 1 and 4 cylinder types. Illustrated is the sensational Model VE-4, 4 cylinder V-type engine. Delivers 22 hp. at 2600 R.P.M. Weight: 285 lbs.

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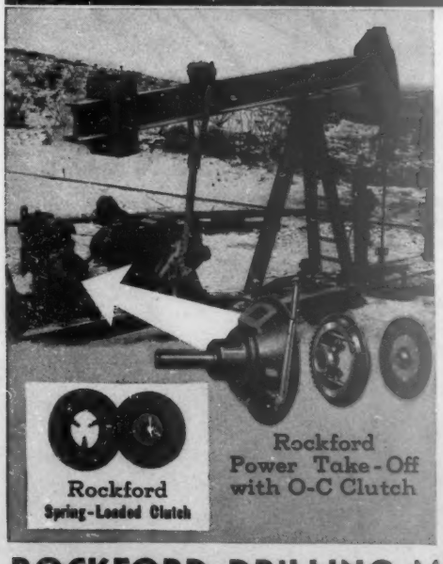

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NORTH CENTRAL TEXAS

New Caddo Lime Pool Showing At Clay County Wildcat

By D. H. STORMONT

WICHITA FALLS, Tex.—A new Caddo lime oil-producing area for Clay County, 1½ miles north of the Henderson pool, may result from testing operations which are now under way at Continental and Roy Lee 1 H. Watson, W. A. Farris Survey. Early in the week, 1 Watson drilled lime showing oil from 5,455-72 ft. and cored additional shows from 5,472-84 ft. The top of the Caddo lime was logged at 5,199 ft.

On a 9-minute drill-stem test from 5,455-84 ft., 1 Watson recovered 330 ft. of free oil and 150 ft. of oil-cut mud. Bottom-hole pressure was 2,480 lb. At last report operator had set casing and was preparing to make production tests. No. 1 Watson was drilled to 4,100 ft. by H. L. Hunt but at that depth Continental reportedly took a half interest in the test and the 160 acres on which it is being drilled.

Large Potential at Wynn

In the Wynn area, 2 miles west of Joy, in Clay County, L. T. Burns has completed his second producer in the pool. The new well is 4 Wynn, Block 34, H. Williams Survey, an old well drilled deeper. No. 1 Wynn was completed to flow 426 bbl. of 45-gravity oil in 6 hours through ¼-in. choke on tubing for an estimated daily potential of 1,704.5 bbl. Production was obtained through casing perforations opposite a section of the Mississippi lime at 6,088-94 ft., with total depth of 6,236 ft. Casing pressure was 900 lb. and tubing pressure 1,040 lb.

No. 4 Wynn is ¼ mile north of the discovery well, Burns 1 Wynn, which was completed at 5,976 ft. As a result of the findings of 4 Wynn, Burns now plans to deepen 1 Wynn in an effort to uncover additional pay. In the meantime, the pool received its third test, with Shell staking location for 1 M. Clark, an east offset to 4 Wynn.

Archer County Wildcat

Additional Caddo lime production was indicated this week in Archer County at the wildcat being drilled by Continental 1 Ferguson, Section 1, S.P. Survey, 3 miles southwest of Holliday. No. 1 Ferguson, in drilling, encountered a show of oil in the Caddo at 4,468-76 ft. and an additional 2 ft. in a core taken from 4,476-88 ft. Two attempts to run a drill-stem test failed and, at the end of the week, operator had drilled to 4,521 ft., logging additional show from 4,511-21 ft., and was running electrical survey.

NORTH TEXAS COMPLETIONS

Wildcats

Archer County: Golding & Cochran 1 M. J. Kundel, B.B.B.&C. Sur., A-54, dry at 5,303 ft., top Caddo 4,689 ft., top Mississippian 5,237 ft.

Clay County: H. S. Gray 1 A. Culver, Sec. 35, Specht & McCutchen subd., dry at 1,300 ft.

Montague County: Gibson & Jennings 4 Roxye Howard, Sec. 90, Kaufman C.S.L. Sur., 86 bbl. in 3 hr., ½-in. choke, est. 400 bbl., pay 3,930-60 ft., T.D. 4,514 ft.

Wichita County: G. W. Cooper 34-C W. T. Waggoner, A. Gibson Sur., A-455, dry at 3,764 ft., top K.M.A. 3,613 ft.

Fields

Benson, Montague County: Stanolind 1 W. D. Seav, Sec. 31, H.&T.C. Sur., A-1261, 62 bbl. in 4 hr., ½-in. choke, est. 275 bbl., top Caddo 5,653 ft., pay 5,796-5,841 ft., T.D. 5,935 ft.

Hull Silk, Archer County: Jesse L. Alexander 5-A J. H. White, Sec. 34, Lot 12, A.T.N.C.L. Sur., dry at 1,001 ft.

K.M.A., Wichita County: Hanlon-Buchanan 29-E Fassett & Tuttle, S.A.&M.G. Sur., A-582, 53 bbl. in 3 hr., 21/64-in. choke, est. 275 bbl., 145-qt. shot and 2,000 gal. acid 4,010-44 ft.

F. W. Merrick, Inc., 10 O. M. Jones, Sec. 2, B.S.&F. Sur., A-485, 220 bbl. in 24 hr., pumping, top K.M.A. 3,920 ft., 200-qt. shot 4,050-4,112 ft., T.D. 4,114 ft.

Hammon, Hanlon-Buchanan 49-F Fassett & Tuttle, Sec. 1, E.T. Sur., A-76, 15 bbl. in 24 hr., pumping, pay 619-30 ft.

South Electra, Wichita County: Magnolia 11-B W. T. Waggoner, Sec. 13, H.&T.B. Sur., A-137, dry at 3,476 ft.

Throckmorton, Throckmorton County: W. Neustadt 1-A W. M. McKeichan, J. S. Wright Sur., A-1283, 7 bbl. in 24 hr., pumping, pay 617-35 ft.

W. Neustadt 3 W. M. McKeichan, J. S. Wright Sur., dry at 726 ft.

Walnut Bend, Cooke County: Sinclair 6 Neal Atkins, Sec. 59, Fannin C.S.L. Sur., 81 bbl. in 12 hr., pumping, est. 120 bbl., pay 4,782-93 ft., T.D. 4,838 ft.

Wilbarger, Wilbarger County: Summit Oil Co. 7 W. T. Waggoner, Sec. 14, Blk. 13, H.&T.C. Sur., 6 bbl. in 24 hr., pumping, 10-qt. shot 1,694-1,700 ft.

Miscellaneous

Archer County: Henry Grace 6-B L. F. Wilson, Sec. 1, Blk. 87, A.T.N.C.L. Sur., dry at 1,448 ft.

Clay County: M. Hudson 2 C. T. Taylor, Bacon's subd., dry at 1,320 ft.

Metzner & Burns 29 L. Thornberry, Sec. 11, Thornberry subd., dry at 1,305 ft.

Darby-Lunde Co. 1-40-B J. D. Stine, Sec. 7, Byers Bros. subd., 10,000 cu. ft. gas, pay 1,724-46 ft., T.D. 1,795 ft.

Johnson & Kouri 12 C. T. Taylor, Sec. 56, Bacon's subd., 50 bbl. in 24 hr., pumping, pay 1,130-40 ft.

Akin, Dimoch & Costley 6-A J. C. Sancer, Sec. 5, Pratt's Past. subd., 35 bbl. in 24 hr., pumping, pay 1,104-22 ft.

Wichita County: J. W. Hastings 3 L. F. Ramming, H. Hastie Sur., A-92, 71 bbl. in 24 hr., pumping, pay 1,208-20 ft.

C. E. Morrison 3 J. L. Powell, Sec. 21, H.&G.N. Sur., A-142, 12 bbl. in 24 hr., pumping, pay 804-42 ft., T.D. 910 ft.

Young County: H. B. Streit 7-A J. L. Jack, Sec. 23, Young C.S.L. Sur., A-1284, 7 bbl. in 24 hr., pumping, pay 534-58 ft.

R. L. Wheelock 1 F. P. Pace, A. Rohus Sur., A-240, dry at 690 ft.

Abilene Discovery Completed; Wimberly Gets Extension

FORT WORTH, Tex.—Final completion was announced this week for J. C. Hunter 1 Anderson, Section 8, L.A.L. Survey, 3 miles south of Abilene in Taylor County. No. 1 Anderson opens a new oil-producing area for West Central Texas.

The new discovery was completed on the pump for 19.2 bbl. of oil daily from the Palo Pinto lime, which was topped at 3,358 ft. and drilled to 3,393 ft. Operator had acidized the test before making completion attempt.

In the same county, 2½ miles west of Merkel, C. W. and William L. Snoddy are moving in rig at 1 D. L. Tipton. No. 1 Tipton, a wildcat, was underreaming casing at 2,800 ft. early in the week when gas ignited and the rig was destroyed. Location is 330 ft. out of the southeast corner of the east 100 acres of the west 200 acres of Section 20, T.&P. Survey 18.

Wimberly Extension

The Wimberly area of southwestern Jones County was given a slight west extension this week. The extension well is Fain-McGaha 1 Davie Tarpley, a west offset to R. L. Foree 1 W. H. Sandford. No. 1 Tarpley topped the pay horizon at 2,325 ft. and was shut in after it began flowing by heads. It is located 330 ft. out of the northeast corner of Block 104, De Witt C.S.L. Survey 126.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Haskell County: E. C. Lawson 1 C. C. Rose, J. McCass Sur. 57, A-95, 85 bbl. in 8 hr., pumping, est. 50 bbl., pay 2,664-85 ft., T.D. 3,002 ft.

Fields

Cook, Shackelford County: Roeser & Pendleton, Inc., and Continental 9-A-117 W. I. Cook, Sec. 117, E.T. Sur., 173 bbl. in 24 hr., pumping, pay 1,691-1,701 ft., T.D. 1,705 ft.

Jim Ned, Coleman County: Lewis Production Co. 2 C. M. Green, Lot 2, Hiram Kegans Sur. 520, 184 bbl. in 24 hr., and 4,920,000 cu. ft. gas, ¾-in. choke, pay 3,476-3,500 ft.

Lewis, Jones County: Butler & Horne 6 C. C. Lendeman, Sec. 5, T.&P. Sur., Blk. 15, dry at 1,960 ft.

McCaulley, Fisher County: F. A. Stephenson 1 A. M. Eivens, Sec. 51, H.T.&B. Sur., Blk. 1, 74 bbl. in 12 hr., est. 100 bbl., 2,750 gal. acid 3,260-69 ft., T.D. 3,298 ft.

Brown-Gardiner 1 Eva Parker, Sec. 51, H.T.&B. Sur., Blk. 1, 35 bbl. in 24 hr., pumping, 4,250 gal. acid 3,059-75 ft., T.D. 3,336 ft.

Scranton, Callahan County: Bennett & Little 2 W. P. Ledbetter, M. Cherry Sur. 4, 52 bbl. in 9 hr., pumping, est. 100 bbl., pay 1,721-27 ft.

Wimberly, Jones County: Butler & Horne 2 A. M. Wimberly, Guadalupe Martinez Sur. 137, 140 bbl. in 8 hr., ¾-in. choke, pay 2,222-34 ft.

Clark & Cowden 2 A. M. Wimberly, Lot 106, Godwin subd. of De Witt C.S.L. Sur. 126, 96 bbl. in 6 hr., ¾-in. choke, est. 300 bbl., pay 2,205-20 ft., T.D. 2,225 ft.

MICHIGAN OPERATIONS

Small Boom Started by Clare County Discovery

By OTTO PRESSPRICH

SAGINAW, Mich.—A spurt in drilling activity in Clare County has resulted from the recent Seba Oil & Development Co. Owendale wildcat discovery in Section 36 of Lincoln Township. Freeman Oil Co. was drilling below 1,500 ft. on the first test since the discovery, ½ mile to the north in Section 5 and several other companies were beginning operations as the week began. While a small oil well and two more natural-gas wells were being completed in the Winterfield-Clare area, another Clare County wildcat test failed as Mogul Oil Co. reported its 1 Jankowski in Section 14 of Franklin Township dry at 4,172 ft.

Of 13 completions recorded last week in Michigan, 6 were oil producers, 3 natural-gas wells and 4 were dry holes, including Saginaw, Lake and Missaukee counties wildcat tests. The Saginaw test, in Section 26 of Lakefield Township, drilled by Sun Oil Co. on its Rosewig lease, got a show of oil but it was insufficient for commercial development.

MICHIGAN COMPLETIONS

Allegan County, Hopkins Township: Sprenger Bros. 1 Moore & Arndt, SE SW SE 7-3n-12w, pumping 150 bbl., acidized, T.D. 1,633 ft.

Regal Dutch Petroleum Co. 2 Wamhoff, NW NW NE Sec. 18, pumping and flowing 212 bbl., acidized, T.D. 1,603 ft.

Bay County, Monitor Township: Gulf Refining Co. 1 Schweitzer, C N½ SW SW 1-14n-4e, 30 bbl., acidized, T.D. 2,862 ft.

Clare County, Franklin Township: Mogul Oil Co. 1 Jankowski, C N½ NE NW 14-20n-3w, wildcat, dry, T.D. 4,172 ft.

Winterfield Township: Sun Oil Co. 2 Goodrich, C E½ NE SW 32-20n-6w, pumping and flowing 25 bbl., acidized, T.D. 3,110 ft.

Taggart Bros. Co. 95 Larson-Dunn, C SE Sec. 18, 2,520,000 cu. ft. natural gas, T.D. 1,361 ft., P.B. from 1,366 ft.

Taggart Bros. Co. 98 Perro-Acker-Bray, C NW Sec. 30, 18,300,000 cu. ft. natural gas, T.D. 1,350 ft.

Lake County, Sauble Township: William Shoemaker 1 Reese, C E½ NE SE 29-19n-14w, wildcat, dry, T.D. 785 ft.

Missaukee County, Reeder Township: Union Drilling & Producing Co. 1 Kelly Sisters, C S½ SE NE 29-22n-7w, wildcat, dry, T.D. 4,398 ft.

Osceola County, Lincoln Township: Taggart Bros. Co. 34 Kent, C SW 34-18n-10w, 9,600,000 cu. ft. natural gas, T.D. 1,280 ft.

Saginaw County, Lakefield Township: Sun Oil Co. 1 Rosewig, C N½ NW NE 26-11n-1e, wildcat, dry, T.D. 3,153 ft.

Van Buren County, Bloomingdale Township: R. D. Malcolm, Tr., 2 Dvorak, NE NW NE 12-1s-14w, pumping 20 bbl. oil and water, acidized, T.D. 1,275 ft.

Bridger Basin Oil Co. 2 Stadler-Melching communitized, NE SW SW Sec. 1, pumping 60 bbl., acidized, T.D. 1,282 ft.

Wildcatting Near McLean Gains as Well Checks High

By F. L. SINGLETON

CORPUS CHRISTI, Tex. — With a second well located in the new McLean field, Webb County, reported to be running high, interest in this new strike was gaining momentum, and a number of wildcats are scheduled to be drilled along the trend in the near future. This discovery, located 7 miles southwest of Bruni and about 4 miles east of the old Mirando City-Aviation fields, is of especial significance to the Laredo district in view of the fact that the oil is of high gravity (55) and is apparently from a new sand in the Yegua, being some 1,200 ft. below top of the Mirando sand and over 100 ft. lower than the Bruni pay. O. W. Killam, who completed the discovery well in sand at 3,240-48 ft., has started drilling operations on two wells, and 2 Marrs McLean, 1,300 ft. to the northwest is reported to be checking 19 ft. structurally high as it drills ahead below 2,300 ft. after coring sand with an oil odor at 2,194-2,203 ft. To the southwest, about 1 mile in Survey 609, 1 Garcia was spudded. To the north, and located 4 miles north of Bruni in the Roman Benavides Survey 692, H. M. Amsler has started drilling operations on 1 Benavides.

Washburn-Wilcox Extended

Wilcox sand production in the Washburn field, La Salle County, was extended 1,200 ft. to the south as Quintana 6 Washburn was flowing at the rate of 400 bbl. of fluid per day through a ¼-in. choke, while testing sand at 5,540-56 ft. Tubing pressure was 400 lb., and shut-in casing pressure 1,275 lb. The well is reported to have checked structurally low to the completed wells, and it is doubtful if production will extend much further in this direction. In the meantime, the company's 1 Naylor & Jones, 2½ miles north of the field, was abandoned at 5,582 ft., and none of the sands which produce in the field proper are reported to have been logged.

The wildcat play which was expected to follow the discovery of the above field is getting under way. In southwestern McMullen County, Cities Service and Continental Oil Co spudded 4-B Lower, located in the A. J. Martin Survey 130, while in the same area, Quintana Petroleum Corp. is moving in material for 1-C South Texas Syndicate in the B.S.&F. Survey 25. Both wells are being drilled on large blocks which have been worked extensively with geophysical instruments.

In line with this play, and located south of Caesar field, Bee County, T. B. Slick, Jr., 1 J. J. Grissom continued to show an increase in production, and definitely establishes Carrizo sand production for the area. On a recent test, the well flowed at the rate of 8½ bbl. of 47.4-gravity oil per hour through 7/64-in. and ¼-in. chokes. Tubing pressure was 2,200 lb., and shut-in casing pressure 2,350 lb. The field, which has been named South Caesar, is located in the P. B. McEarly Survey.

Another Well at Yturria

Another producer was being added to the Yturria field, southern Starr County, as Sun 4-A Chapotal recovered 728 ft. of oil and tested 94 lb. working pressure on a 15-minute drill-stem test at 4,222-29 ft., the total depth. Five and one-half inch casing was cemented at 4,223 ft. This is the fifth producer for the structure which is yet to be defined.

SOUTHWEST TEXAS COMPLETIONS

LOWER GULF COAST DISTRICT

Wildcats

Bee County: Henderson Coquat 1 Borroum, dry, T.D. 3,730 ft.

Fields

Agua Dulce, Nueces County: Hewitt & Dougherty 2 Ariedge, 20,000,000 cu. ft. gas open flow, perf. casing 6,915-25 ft., T.D. 7,067 ft.

Richardson Petroleum Co. 5 Knight-Jackson, 61 bbl., 5/64-in. choke, perf. casing 7,046-51 ft., T.D. 7,058 ft.

S. E. W. Oil Corp. 1-A Pfluger, 143 bbl., ⅛-in. choke, perf. casing 7,055-66 ft., T.D. 7,114 ft.

Ben Bolt, Jim Wells County: Mosser & Graham 1 Roberts, dry, T.D. 5,510 ft.

Fagan, Refugio County: Seatex 2 Fagan, 37 bbl., 3/32-in. choke, perf. casing 5,339-74 ft., T.D. 5,971 ft.

Kingsville, Kleberg County: Dietert et al 3-A Henry, 50 bbl., ⅛-in. choke, perf. casing 2,466-71 ft., T.D. 2,557 ft.

Minnie Bock, Nueces County: E. A. Graham 4 Riedel, 48 bbl., ⅛-in. choke, perf. casing 3,780-93 ft., T.D. 3,812 ft.

McAllen, Hidalgo County: W. R. Davis 1 Jackson, 20,000,000 cu. ft. gas, 32 bbl. distillate, ¼-in. choke, perf. casing 7,060-80 ft., T.D. 7,800 ft.

Plymouth, San Patricio County: Texon Royalty 7 Rambo, 195 bbl. fluid, 50 per cent oil and 50 per cent salt water, ¼-in. choke, perf. casing 5,496-5,500 ft., T.D. 6,171 ft.

Seeligson, Jim Wells County: Magnolia 26 Seeligson, 140 bbl., 22 hr., 12/64-in. choke, perf. casing 6,101-04 ft., T.D. 6,226 ft.

Stratton, Nueces County: Humble 8 King, 121 bbl., ⅛-in. choke, T.D. 6,661 ft.

Mid-Continent Petroleum Co. 1 Martindale, 113 bbl., ⅛-in. choke, perf. casing 6,660-75 ft., T.D. 6,684 ft.

Victoria, Victoria County: John B. Coffee 1 Simon, 48 bbl., pumping and flowing, perf. casing 2,674-76 ft., T.D. 3,076 ft.

West Alfred, Jim Wells County: Wilcox Oil & Gas Co. 1 O. S. Adams, dry, T.D. 5,303 ft.

LAREDO DISTRICT

Wildcats

Duval County: One Hundred & One Oil Co. 1 Martinez, dry, T.D. 2,705 ft.

Live Oak County: Charles Burns 1 Gerwitz, dry, T.D. 2,720 ft.

Zapata County: Forrest Development Co. 2 Ramirez, dry, T.D. 2,502 ft.

Fields

Casa Blanca, Duval County: M. L. Massingill 4 Duval County Ranch Co., 95 bbl., pumping, sand 1,053-65 ft., 1,077-85 ft.

Colorado, Jim Hogg County: Sun 1-B East, 105 bbl., 9/64-in. choke, sand 2,901-11 ft.

Humble 52-B King ranch, 149 bbl., ⅛-in. choke, T.D. 2,872 ft.

Humble 53-B King, dry, T.D. 2,850 ft.

Government Wells, Duval County: Sun 77-A Wiederkehr, 123 bbl., pumping, sand 1,818-30 ft.

Hoffman, Duval County: Magnolia 24 Weil, 45 bbl., pumping, sand 2,688-96 ft.

Peters, Duval County: P. L. Keller 1 Peters, 1,550,000 cu. ft. gas, open flow, perf. casing 2,615-18 ft., T.D. 2,663 ft.

Sejita, Duval County: Trinity Gas Corp. 1 Ramirez, 14,500,000 cu. ft. gas, open flow, perf. casing 5,468-87 ft., T.D. 5,632 ft.

Seven Sisters, Duval County: S. C. Creech 1 Wright, dry, T.D. 3,036 ft.

South White Creek, Live Oak County: Henderson Coquat 2 Everett, 176 bbl., ¼-in. choke, perf. casing 1,848-53 ft., T.D. 1,865 ft.

Sun, Starr County: Humble 2 Block, dry, T.D. 4,743 ft.

South Campana, McMullen County: Magnolia 1 Kynette, 38 bbl., ⅜-in. choke, T.D. 3,040 ft.

SOUTH CENTRAL TEXAS DISTRICT

Wildcats

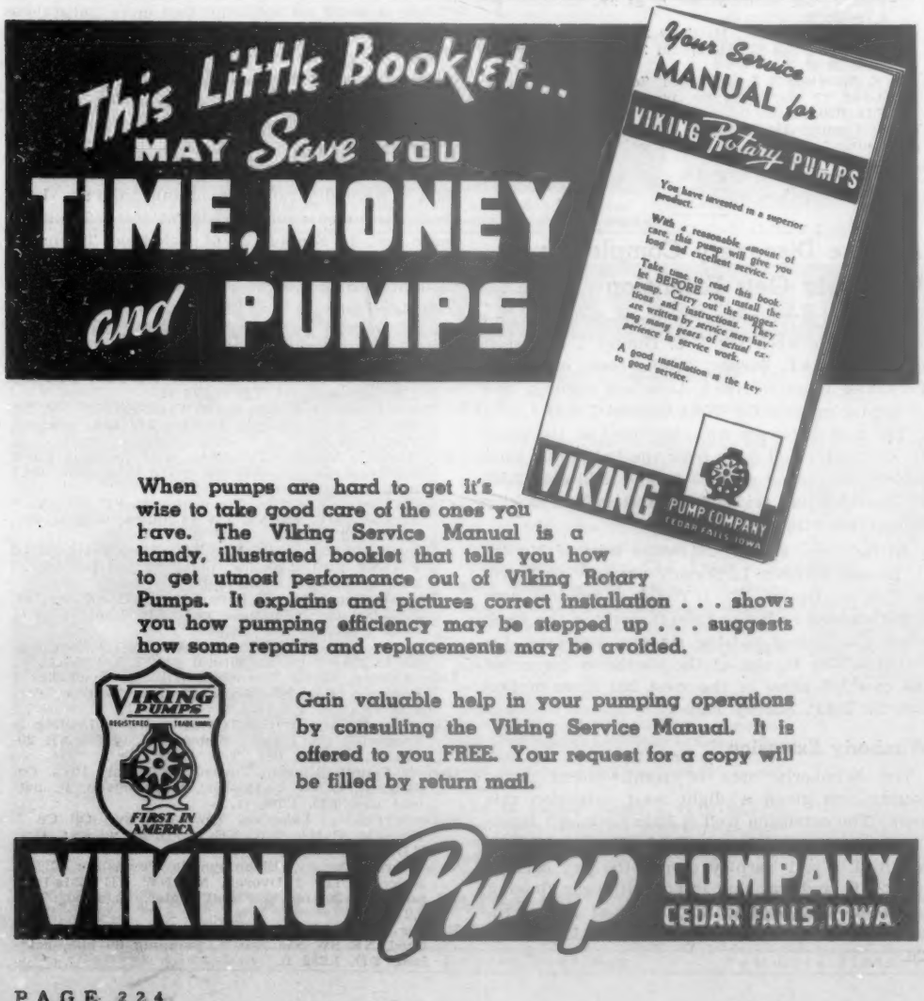
Atascosa County: Jack Gilbin 1 Sam C. Richter, dry, T.D. 1,057 ft.

Bastrop County: J. B. Patty 1 Zilas, dry, T.D. 1,887 ft.

Fields

Gas Ridge, Bexar County: Gas Ridge, Inc., 4 Hamilton, 2 bbl., pumping, sand 410-11 ft., 452-53 ft., T.D. 486 ft.

Minerva-Rockdale, Milam County: Transtate 1 Von Goten, 2 bbl., pumping, T.D. 689 ft.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NORTH LOUISIANA, ARKANSAS

Two Producing Zones Proved By Midway Discovery Well

By R. MARNE SANFORD

SHREVEPORT, La.—One of the most heavily attended oil and gas hearings in Arkansas was held at Lewisville last Thursday when field rules were drawn up for the new Midway field in Lafayette County. The rules established were such that early predictions point to an immediate and intense drilling program for the new area. A total of 15 drilling permits were granted by the Oil and Gas Commission and many of these are already drilling.

The new field was opened by Barnsdall Oil 1 Bond, which came in about 2 weeks ago for an estimated open-flow production of 12,000 to 15,000 bbl. daily from the Smackover lime. Six of the new permits went to Barnsdall Oil Co., one to Arkansas Fuel Oil Co., four to Southwood Oil Co., and one each to Sun Oil Co., P. R. Rutherford, J. E. Roberts and E. P. Wingfield.

The hearing disclosed for the first time that two distinct producing zones are present in the field and that dual completion may be granted by the commission. According to cores and electrical logs of the discovery well, a middle section of about 47 ft. in thickness divides the two horizons. Cores from each zone revealed the oil to be of about the same gravity. Barnsdall may complete its second test from the lower horizon. Its discovery is producing from the upper zone found at 6,304 ft. It was also revealed that Barnsdall plans to construct a gasoline plant in the field.

The commission adopted a 40-acre spacing pattern for the field and set the allowable for the one well at 400 bbl. daily. As other wells are completed this allowable will be reduced until four wells are completed, at which time a permanent daily allowable of 250 bbl. daily will be given each well and subsequent completions.

North Louisiana Deep Well Still Untested

Center of attention and interest in North Louisiana for another week was the deep 11,885-ft. well in Claiborne Parish which is still awaiting tests. It is Union Producing Co. 1 McDonald, 13-21-5, now waiting on cement after running 11,872 ft. of 7-in. casing into the hole. Heavy shows of gas with some distillate were found at the total depth of 11,885 ft.

Meanwhile, plans were progressing toward the spudding of a third deep test in the new area. It will be 1-B Meadows, between the new gas discovery and the original distillate discovery of last March. The new operation is to be in 13-21-5, while the original distillate discovery of several months ago is in 18-21-4. In the same parish and east of Haynesville a closely watched deep wildcat is drilling ahead. It is Hunt Oil 1 M. B. Mitchiner, 15-23-7, which is going ahead below 10,675 ft.

NORTH LOUISIANA COMPLETIONS

Wildcats

Avoyelles Parish: Placid Oil 1-D Southwest Improvement Co., NE SW 11-2n-7e, dry at 7,474 ft.

De Soto Parish: Roscoe & Carter 1 McGill, NE SW 1-10n-13w, base chalk 1,900 ft., dry at 2,004 ft.

Tensas Parish: Carter Oil 1 Rhodes, irregular Sec. 29-9n-10e, top Vicksburg 813 ft., Cook Mountain 1,913 ft., Sparta 2,087 ft., Cane River 2,930 ft., Wilcox 3,394 ft., Midway 6,342 ft., dry at 6,590 ft.

Fields

Caddo, Caddo Parish: Bayou State Oil 2-B Stiles, NW NW 27-21n-16w, 25 bbl., 1,037 ft.

Clemons-Swartz & Clemons 5 Arkansas Fuel Oil fee, SE SE 26-21n-16w, 5 bbl., 2,888 ft.

H. C. Cummings 1 Oil City Land & Oil Co., SE NW 7-20n-15w, dry at 3,086 ft.

Carterville, Webster Parish: Placid Oil 1 Pinewoods Lumber Co., irregular Sec. 37-22n-11w, 10 bbl oil and 160 bbl. water, 2,699 ft.

Little Creek, La Salle Parish: Placid Oil 109-F Goodpine, SW SE 25-9n-1e, 150 bbl. oil and 6 bbl. water, perf. casing 2,452-59 ft., 2,710 ft., T.D.

Monroe, Union Parish: Carbons Consolidated 1 Wheeler, NW SE 9-21n-3e, 4,928,000 cu. ft. gas, 2,178 ft.

N & W Corp. 1 Swan, NW SE 30-20n-4e, 5,114,000 cu. ft. gas, 2,150 ft.

N & W Corp. 3 Union Prod. fee, NW NW 27-21n-3e, 2,608,000 cu. ft., 2,181 ft.

Nebo, La Salle Parish: H. L. Hunt 39-A Goodpine, NW SE 10-7n-3e, 95 bbl. oil and 28 bbl. water, perf. casing 4,035-37 ft., 4,100 ft., T.D.

Placid Oil 1 Taylor unit, N½ Lot 6, 40-7n-3e, 100 bbl. oil and 35 bbl. water, perf. casing 4,180-83 ft., 5,140 ft., T.D.

Olla, La Salle Parish: Arkansas Fuel Oil 2-F F. M. Kees, SW NW 8-10n-3e, dry at T.D. 2,355 ft.

ARKANSAS COMPLETIONS

Fields

Dorcheat, Columbia County: Delta Drlg. Co. 1 Jeff Hunt, SE SW 11-18s-22w, 168 bbl. distillate, 1,176,000 cu. ft. gas, 8,907 ft., T.D.

East Schuler, Union County: Tide Water Associated Oil 1 Garrett, NW NW 24-18s-17w, dry at 5,757 ft., T.D.

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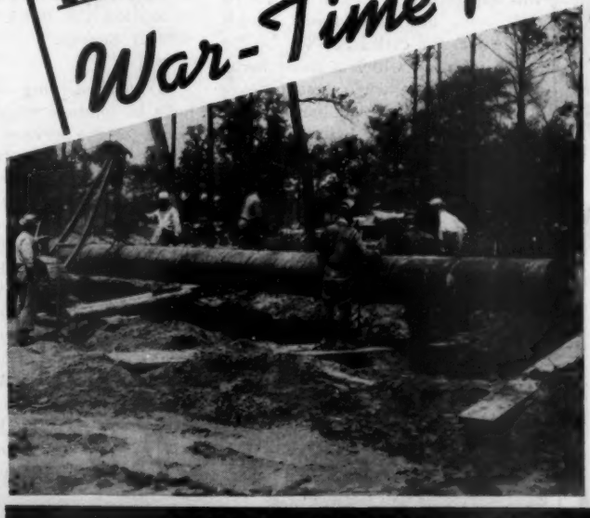

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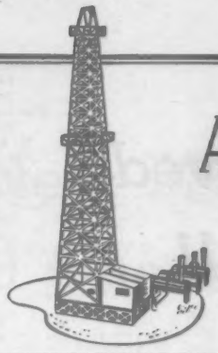

Among the Drilling

JOHN F. BURTON, Allegan, Mich., has contract to drill A. W. Winchester et al 1 Hellwig, SE NE SE, 13-1n-16w, Allegan County, Michigan.

NICKLOS Drilling Co., Houston, Tex., has reached an interesting depth in Continental Oil Co. 1 Doman, a wildcat in Matagorda County, Texas, while in the Ville Platte and Tepetate fields, Louisiana, four rotaries are running for the same company. On the east flank of the Pine Prairie dome, Evangeline Parish, Louisiana, drilling was started on E. J. Nicklos 2 Reed.

LUPHER Drilling Co., Mount Pleasant, Mich., has 12 rigs operating in Osceola County, Michigan, for Pure Oil Co. and Ohio Oil Co. Seven strings of tools are assigned to Pure operations in Lincoln Township, four are engaged by Ohio in the same township and the latter company is using Lupher equipment on a well in Richmond Township.

HARRY L. EDWARDS Drilling Co., Houston, Tex., is moving a rotary to the Cologne field, Victoria County, Texas, for Jimmie Gray. In the meantime distillate production was apparently opened in the Thornwell area, Jefferson Davis Parish, Louisiana, for Cities Service Oil Co. at 1 Lacassine which showed favorable indications when tested below 10,000 ft. In the St. Charles (La.) field an attempt is being made to extend production as preparations were being made to test Continental 4 St. Charles Co.

WALTER CRIBBET, Allegan, Mich., has taken contract to drill Fortney & Broughton 1 Blaha, SW NW SE, 1-1s-14w, Van Buren County, Michigan.

FALCON-SEABOARD Drilling Co., Houston, Tex., is moving two rotaries to the Midway field in Arkansas for Barnsdall Oil Co., while in West Virginia another deep test is being started for the Hope Natural Gas Co. Other activity is reported in the Gibson field, Terrebonne Parish, for Shell Oil Co., Inc.; at the Ville Platte field, Evangeline Parish, for Continental Oil Co., and in the Gena area, Catahoula Parish, Louisiana, for Sinclair Prairie Oil Co. In Pratt County, Kansas, a joint wildcat test is being drilled with Atlantic Refining Co.

UNGREN & FRAZIER, drilling contractors, Abilene, Tex., are moving in rig to resume drilling on the C. W. and William L. Snoddy 1 D. L. Tipton, wildcat, 2½ miles west of Merkel, Taylor County, Texas. Two weeks ago, a rig on the test was destroyed by fire when gas ignited as casing was being underreamed at 2,800 ft. The wildcat is located 330 ft. out of the southeast corner of the east 100 acres of the west 200 acres in Section 20, T.&P. Survey 18.

HOUSTON Drilling Co., Houston, Tex., is nearing contract depth on an outpost well in the North La Ward field, Jackson County, Texas, for the Salt Dome Oil Corp. Completion of the well for a commercial producer would extend the field about 4,000 ft. west.

LOGCO Drilling Co., San Antonio, Tex., received contract from Cities Service Oil Co. for an initial test to be drilled in the North La Ward field, Jackson County, Texas.

LOFFLAND BROS., Fort Worth, Tex., drilling contractors, have reached specified depth on the Sinclair 1 Charles J. Kleiner, Yoakum County, Texas, wildcat, with only slight shows of oil reported after acidizing from 5,450-5,600 ft. Total depth is 5,600 ft. The test is 3½ miles northwest of the Owenby pool, in Section 436, Block D, in the J. H. Gibson Survey.

ROTARY drilling contractors may have to compete with the Army Air Corps for the services of roughnecks if the expressed preference of a Texas recruiting officer falls on responsive ears. Oil field roughnecks, the recruiting officer declared, make an almost perfect specimen for parachute troops. He said the average roughneck would make a "natural" for this type of devil-may-care but highly colorful branch of the Army's service. Chief qualifications for recruits in the "umbrella brigade" are that men must be muscular, weigh no more than 185 lb., be between the ages of 20 and 30 years and possess a steady blood pressure.

HODGES Drilling Co., Abilene, Tex., lost one of its drillers last week when J. C. Burton, 29, died from results of burns received when gas ignited at a well being drilled near Merkel, Taylor County, Texas.

GOLDSTON Drilling Co., Houston, Tex., opened the first crude production in the Needville distillate field, Fort Bend County, Texas, by completion of W. L. Goldston 1 Smith, which is flowing pipe-line oil from the Frio sand at 5,190-94 ft. The well is south of the discovery which was completed last year as a gas-distillate producer at approximately the same depth.

SAWYER Drilling Co., Houston, Tex., has a rig in operation in the new Stowell area, Jefferson County, Texas, where an offset to production is being drilled for Sinclair Prairie Oil Co. In the West Texas area, three rigs are running in the Odessa and Sundown areas for Sinclair Prairie Oil Co., and the Texas Co.

BALDRIDGE & KING, McAllen, Tex., have taken contract to drill a deep wildcat test for McCollum Exploration Co., south of Donna and Alamo in Hidalgo County, Texas.

C. C. GULGER, Houston, Tex., has received contract for a 6,200-ft. wildcat test to the Rodessa section of the Glen Rose in northern Marion County, Texas, 2 miles northeast of the

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Lodi community. Operator is John Messenger et al. The location, on a 51-acre Singleton tract in the James Wanhope Survey, is about 4 miles northeast of the Lodi portion of the Jefferson Glen Rose field.

HENSHAW BROTHERS, San Antonio, Tex., will drill a 7,000-ft. wildcat 4 miles southwest of the Spring field in Jim Wells County, Texas, near the Duval County line for Bruce Baxter et al on the John Koopman 240-acre tract in Section 21, Plummer resubdivision, San Leandro grant.

PAUL FRAZIER, Houston, Tex., contractor, has agreed to drill Paul G. Benedum 1 L. L. & E., an Iberia Parish, Louisiana, wildcat prospect in the Grande Marie area.

J. R. SHARP, Tulsa, has contract for Stanolind Oil & Gas Co.'s new wildcat test in Lubbock County, Texas. The test is 1 Stinnett, in Labor 18, League 4, San Augustine County School Lands, 7 miles east and 3 south of L. C. Harrison et al 1 Nairn estate, a discovery producer from the Clear Fork. The Harrison producer is 3½ miles northwest of Lubbock.

GEORGE LIVERMORE, Inc., Lubbock, Tex., contractor and operator, has assigned rotary to a wildcat location in Terry County, Texas, where a test will be drilled on the George Mabee land in 20-D11, C. & M. Survey, 1½ miles south of the production in the southeastern part of the Slaughter field.

DALE SMITH, Coleman, Tex., contractor, is moving in tools to drill a 2,400-ft. wildcat test in Coleman County, Tex., 9 miles north of town. Location is on the J. P. Morris ranch, David Breeding Survey.

NEWMAN Drilling Co., San Antonio, Tex., is moving rig to a new location for Highland Oil Co. et al near the recent discovery 3 miles northeast of the Kreis field in Duval County, Texas. Location is for A-2 Garza in the southwest quarter of Survey 524.

WRIGHT Drilling Co., Houston, Tex., is moving rig to location for K. R. Voelkel et al 1 O. G. Rogers in the Greenwood Survey, southwest of Elkhart in Anderson County, Texas.

ADDISON Drilling Co., Midland, Tex., is moving standard rig to a south offset location to Culbertson & Irwin, Inc., and Southern California Petroleum Corp. 1 Beulah V. Lynch, new discovery producer, 4 miles north of the Halfway field in Lea County, New Mexico. Addison drilled the discovery well which produced 245 bbl. daily on 24-hour gage.

HELMERICH & PAYNE, INC., Tulsa, has been awarded the drilling contract for a test to Mississippian chat in a 4,200-ft. attempt to extend production ¾ mile northwest of the 20-year-old Tonkawa field in northern Oklahoma. Jodie Payne, Wichita, Kans., and Luther E. Mackall, of New York City, are the operators. Crew is now clearing location for 1 Wood, in NW cor. SW 19-25-1w.

BIG WEST Drilling Co., Dallas, Tex., has progressed to 5,950 ft. on the deep test it is drilling on the Jackson lease in the L. H. Dillard Survey, Chapel Hill.

NELSON Drilling Co., Great Bend, Kans., has completed a small well in Rice County, Kansas, in the NE NE SW 36-19-6w. The outpost well, on the Smyres farm, produced 45 bbl. daily on preliminary test.

IRON Drilling Co., Wichita, Kans., has a rotary idle in Stafford County, Kansas, where the contractor has completed 1 Findley, CWL SW SE 6-24-12w, 2 miles southwest of the Bedford field. The well failed to find commercial production in drilling to 3,950 ft. in the Simpson.

Crew of Harry Stekoll, of Borger, Tex., on location in Hutchinson County, Texas. The men are: F. H. Sabour, production superintendent; Ernest Stafford, pusher and daylight driller; Ivan Wilson; P. H. Lester, and Clovis Cline

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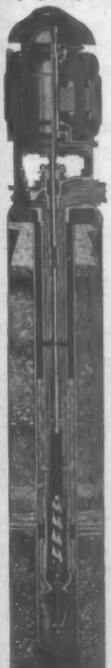

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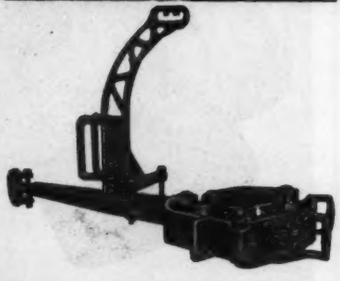

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The Oil and Gas Journal Tulsa, Okla.

EASTERN TEXAS FIELDS

East Texas Field Has Only One Drilling Rig

By D. H. STORMONT

DALLAS, Tex.—The location of six wildcats in the district kept activity at an even pace during the week. Development in proven areas has been sharply curtailed by the recent well-spacing regulation. For the second consecutive week, the big East Texas field was unable to announce a single new location. All drilling has ceased with the exception of one rig which is a workover job. Wildcats were staked in Navarro, Freestone, Anderson, Red River, Houston, and Upshur counties.

Most active proven areas were the Chapel Hill sector in eastern Smith County, with eight wells drilling, and the Hawkins pool in Wood County. The latter was given a small extension this week, with Humble completing 1 Simmons, Esparcia Survey. No. 1 Simmons flowed 91 bbl. of oil in 6 hours through ¼-in. tubing choke from 5,023 ft. This well was one of six completed during the week and extended the field a short distance to the west.

Grapeland May Be Extended

Lone Star Gas Co. is adding to its holdings on the west side of the Grapeland field in Henderson County on the strength of the showing of its 1 Ford Newman, Procella Survey, which is reported indicating a west extension to the field. Although no gage has been reported, 1 Newman is believed to be a good gasser. Operator has set pipe at 5,945 ft., 2 ft. off bottom.

Wildcat Believed High on Pecan Gap

Now nearing the base of the Pecan Gap chalk, Iowa-Payne Oil Co. 1 Weisner, Goliher Survey, southeastern Henderson County wildcat, reported logging the top of the chalk at 3,370 ft. With elevation of 383 ft., 1 Weisner topped the Pecan Gap, first marker, at a subsea point of 2,987 ft.

NEW WILDCAT LOCATIONS

EASTERN TEXAS

Anderson County: K. R. Voelkel 1 O. G. Rogers, William Greenwood Sur., 8 mi. SW of Elkhart, 1,900 ft. from SW and 1,500 ft. from SE lines of 536-ac. tract.

Freestone County: Frank J. Gravis 1 J. L. Bonner, M. Anderson Sur., 7 mi. NW of Fairfield, 660 ft. from S and 1,194 ft. from E lines of 120-ac. tract.

Houston County: O. W. Killiam 1-A Houston County Coal Co., J. Henley Sur., 1½ mi. N of Lovelady, 660 ft. out of southern NE cor. of tract.

Navarro County: Dodwell & Ubank 1 S. A. West, T. O. Jones Sur., NW of Bazzette, 1,200 ft. SW of NE line and 1,211 ft. NE of SW line of 73-ac. tract.

Red River County: C. B. Morris 1 Stewart Stanley, W. P. Snell Sur., 11 mi. N of Clarksville, 467 ft. from S and E lines of 50-ac. tract.

Upshur County: A. H. Carpenter 1 P. W. White, J. Carson Sur., 2 mi. NW of Big Sandy, 1,263 ft. from S and 692 ft. from W lines of 81-ac. tract.

EAST TEXAS COMPLETIONS

Wildcats

Anderson County: Navarro Oil Co. 1 Davey & Royall, 4 mi. NW of Jarvis, C. Rucker Sur., dry at 5,467 ft.

Falls County: Preston Managhan 1 R. H. Perkins, Perda Zarza Sur., 1 mi. NW of Moorville, dry at 265 ft.

McLennan County: T. M. Smart 1 Irene Connally, I. Larer Sur., 4 mi. SE of McGregor, dry at 425 ft., top Walnut 425 ft.

Fields

Chapel Hill, Smith County: Shell 1 Amos Ford, P. Lively Sur., 513 bbl. in 24 hr., ¼-in choke, 4,000 gal. acid 8,214-38 ft., T.D. 8,387 ft.

Texas 1 G. R. Phillips, W. Hanks Sur., 562 bbl. in 24 hr., ¼-in. choke, T.D. 8,334 ft.

Grapeland, Henderson County: Geier Bros. and Jackson 1 R. L. Pridgeon, J. D. J. Procillo Sur., 10,000,000 cu. ft. gas, T.D. 5,995 ft.

Hawkins, Wood County: Humble 2 J. H. Ponder, W. Herrington Sur., 110 bbl. in 6 hr., ¼-in. choke, top Austin 4,274 ft., top Woodbine 4,570 ft., pay 4,706-56 ft., T.D. 4,884 ft.

Humble 2 Republic Inc. Co., H. E. Watson Sur., 111 bbl. in 6 hr., ¼-in. choke, top Austin 4,068 ft., top Woodbine 4,328 ft., top Georgetown 4,746 ft., pay 4,658-4,758 ft., T.D. 4,816 ft.

Humble 2 W. J. Shamburger, J. Pollock Sur., 98 bbl. in 6 hr., ¼-in. choke, top Austin 4,430 ft., top Woodbine 4,610 ft., pay 4,735-80 ft., T.D. 4,872 ft.

Humble 1 H. B. Wells, G. Brewer Sur., 127 bbl. in 6 hr., ½-in. choke, top Austin 3,918 ft., top Woodbine 4,138 ft., pay 4,495-4,625 ft., T.D. 4,650 ft.

T. F. Morrow 1 H. F. Downing, G. Brewer Sur., 114 bbl. in 6 hr., ¼-in. choke, pay 4,650-54 ft., T.D. 4,751 ft.

Pleasant Grove, Rusk County: W. L. Pickens 1 J. F. Pool, George May Sur., 353 bbl. in 24 hr., ¼-in. choke, T.D. 4,102 ft.

Thin Pay Is Logged At Mississippi Pool

By R. MARNE SANFORD

JACKSON, Miss.—The second well in the new Pickens-Sharpsburg field, opened in Madison County several weeks ago, was a disappointment last week. The section of saturation was not comparable to that of the discovery.

The well was Phillips Petroleum 1 Gene, SW SE 4-11n-3e, a southeast offset to the Buzz Morgan 1 Johnny, discovery well from the deep Eutaw zone. The 1 Gene is bottomed at a total depth of 4,910 ft. with the pay section having been located by electrical log from 4,849-59 ft. Of this 10-ft. section, only the top 5 ft. showed promise of commercial production.

When drilled in the well made several heads of both oil and salt water, but the water may be successfully shut off. The 7-in. casing was landed at 4,895 ft. and in cementing, the pump broke down and deposited the plug at about 3,854 ft. This cement plug will be drilled out this week and another attempt to seal the casing will be made. The Morgan 1 Johnny is now also reported making some salt water but not in excessive amounts.

MISSISSIPPI COMPLETIONS

Tinsley, Yazoo County: J. P. Evans 7 Dalzell Johnson, NE SW SE NW 31-10n-2w, Woodruff 4,942-5,015 ft., T.D. 5,060 ft., pumped 27 bbl. hourly.

W. B. Johnson Drlg. Co. and Texas Co. 3-A Hennis, SW SE NW 36-10n-3w, Woodruff 4,643-70 ft., T.D. 4,734 ft., pumped 120 bbl. in 6 hr.

Key & Beckett 4 Saunders, SE NE NE 2-9n-3w, Woodruff 4,912-45 ft., T.D. 4,945 ft., pumped 27 bbl. hourly.

Roeser & Pendleton 6 W. T. Stevens, NW SE 2-9n-3w, location abandoned.

(Week January 12-17)

Wildcat, Union County: P. J. McAlpine 1 Nabours, SW NE 36-7s-3e, abandoned location.

Tinsley, Yazoo County: Frank and George Frankel 4 Martin, NW NE NW 1-9n-3w, location abandoned.

Hassie Hunt 3 J. O. Martin, NW S¼ 35-10n-3w, Woodruff 4,835-42 ft., pumped 29 bbl. hourly.

Kirby Pet. 9 G. W. Stutts, SE NW SE 30-10n-2w, location abandoned.

Kirby Pet. 10 G. W. Stutts, NW NW SE 30-10n-2w, location abandoned.

George E. Lilly 1-B Tom Germany, SE SW 29-10n-2w, location abandoned.

C. H. Lyons 2 G. W. Stutts, NE SW 29-10n-2w, location abandoned.

C. H. Lyons 3 G. W. Stutts, NW SW 29-10n-2w, location abandoned.

Magnolia 11 Mitch Payne, SE SW SW 36-10n-3w, Woodruff 4,746-71 ft., T.D. 4,771 ft., pumped 400 bbl. daily.

ALABAMA COMPLETIONS

Wildcat location, Fayette County: J. C. Shepherd 1 fee, NW SE NW 28-16s-11w, set 10¾-in. at 201 ft., T.D. 840 ft., fishing drilling bit.

Wildcat completion, Monroe County: Vaughey & Andrade 1 W. S. Moore, C NW 27-7n-5e, location abandoned.

CANADIAN FIELDS

Turner Valley Well Makes Record Flow

By VICTOR LAURISTON

CHATHAM, Ont.—Crude and natural-gasoline production for all Alberta fields for the week ending January 12 averaged 27,793 bbl. daily, compared with 27,075 bbl. daily for the previous week and 24,866 bbl. daily for the corresponding week of 1941. The daily average included 26,601 bbl. of crude and 919 bbl. of natural gasoline from Turner Valley and 273 bbl. of crude for outside fields. There were 200 producing wells, including 1 new producer, 35 drilling, 7 testing, 1 finished, 2 standing, and 1 new drilling license issued.

Large New Producer

In North Turner Valley, Major Oil 4, LSD 8, 8-21-3w5, finished at 7,836 ft., 421 ft. in the Madison, with initial flow of 18 bbl. hourly. After initial acid treatment it flowed at the rate of 150 bbl. hourly, or 3,600 bbl. a day, eventually getting out of control. After repairing tubing, it is being given further acid treatments, with indications that it will be a larger producer than Major 3, located ½ mile south, which was previously the most northerly producer.

A further extension of the North Turner Valley production area was indicated when Atlas-British Dominion 2, LSD 4, 17-21-3w5, found Madison lime at 8,283 ft. Location is ½ mile northwest of Major 4 producer, and the lime is 868 ft. deeper. Test is deepening after cementing 7-in. casing at 8,351 ft.

Far North Test Starts

Cellar is being prepared and equipment moved for Admiral Oils 1, LSD 12, 27-22-4w5. This is the most northerly location in the North Turner Valley area proper, being 7½ miles north of Major 4, the most northerly producer. Test is expected to spud this month.

Crude-Price Changes

(Continued from Page 189)

39-39.9	$.93	$1.00	$1.10
40 and over	.95	1.02	1.12

Note: Individual schedules vary slightly in starting points and several end at $1.04 for 36°-36.9°. Counties to which schedule applies include: Andrews, Crane, Crockett, Ector, Gaines, Glasscock, Howard, Reagan, Upton, Winkler, Yoakum, Mitchell, Cochran, Hockley and Lea.

GRAY COUNTY, TEXAS

Gravity—	Jan. 1	Mar. 29	May 21
Below 20		$.60	$.70
20-20.9		.62	.72
21-21.9		.64	.74
22-22.9		.66	.76
23-23.9		.68	.78
24-24.9		.70	.80
25-25.9		.72	.82
26-26.9		.74	.84
27-27.9		.76	.86
28-28.9	$.72	.78	.88
29-29.9	.74	.80	.90
30-30.9	.76	.82	.92
31-31.9	.78	.84	.94
32-32.9	.80	.86	.96
33-33.9	.82	.88	.98
34-34.9	.84	.90	1.00
35-35.9	.86	.92	1.02
36-36.9	.88	.94	1.04
37-37.9	.90	.96	1.06
38-38.9	$.92	$.98	$1.08
39-39.9	.94	1.00	1.10
40 and over	.96	1.02	1.12

CARSON, HUTCHINSON AND WHEELER COUNTIES, TEXAS

Gravity—	Jan. 1	Mar.29	May 21
Below 20		$.60	$.70
20-20.9		.62	.72
21-21.9		.64	.74
22-22.9		.66	.76
23-23.9		.68	.78
24-24.9		.70	.80
25-25.9		.72	.82
26-26.9		.74	.84
27-27.9		.76	.86
28-28.9	$.67	.78	.88
29-29.9	.69	.80	.90
30-30.9	.71	.82	.92
31-31.9	.73	.84	.94
32-32.9	.75	.86	.96
33-33.9	.77	.88	.98
34-34.9	.79	.90	1.00
35-35.9	.81	.92	1.02
36-36.9	.83	.94	1.04
37-37.9	.85	.96	1.06
38-38.9	.87	.98	1.08
39-39.9	.89	1.00	1.10
40 and over	.91	1.02	1.12

Note: Some Panhandle schedules start at 83 cents below 25° and scale up to $1.15 for 40° and above. Others start at 28-28.9° and at 34-34.9°.

CLARA DRISCOLL, TEXAS

Gravity—	Jan. 1	Mar. 29	May 21
20-20.9	$0.93	$1.00	$1.00
21-21.9	.95	1.02	1.12
22-22.9	.97	1.04	1.14
23-23.9	.99	1.06	1.16
24-24.9	1.01	1.08	1.18
25-25.9	1.03	1.10	1.20
26-26.9	1.05	1.12	1.22
27-27.9	1.07	1.14	1.24
28-28.9	1.09	1.16	1.26
29-29.9	1.11	1.18	1.28
30-30.9	1.13	1.20	1.30
31-31.9			1.32
32-32.9			1.34
33-33.9			1.36
34-34.9			1.38
35-35.9			1.40
36-36.9			1.42
37-37.9			1.44
38-38.9			1.46
39-39.9			1.48
40 and above			1.50

Note: Applies to Minnie Bock, Clara Driscoll, South Clara Driscoll, Driscoll Ranch, Orange Grove and Wade City.

REFUGIO, TEXAS

Gravity—	Jan. 1	Mar. 29	May 21
Below 20	$0.91	$0.98	$1.08
20-20.9	.93	1.00	1.10
21-21.9	.95	1.02	1.12
22-22.9	.97	1.04	1.14
23-23.9	.99	1.06	1.16
24-24.9	1.01	1.08	1.18
25-25.9	1.03	1.10	1.20
26-26.9	1.05	1.12	1.22
27-27.9	1.07	1.14	1.24
28-28.9	1.09	1.16	1.26
29-29.9	1.11	1.18	1.28
30-30.9	1.13	1.20	1.30
31-31.9	1.15	1.22	1.32
32-32.9	1.17	1.24	1.34
33-33.9	1.19	1.26	1.36
34-34.9	1.21	1.28	1.38
35-35.9	1.23	1.30	1.40
36-36.9	1.25	1.32	1.42
37-37.9	1.27	1.34	1.44
38-38.9	1.29	1.36	1.46
39-39.9	1.31	1.38	1.48
40-40.9	1.33	1.40	1.50

Note: Applies to East White Point, Greta, Melon Creek, O'Connor-McFaddin, Plymouth, Saxet, Taft and Tom O'Connor. Some schedules stop at 28-28.9° and others at 35-35.9°.

ANAHUAC, TEXAS

Gravity—	Jan. 1	Apr. 1	May 21
Below 20	$.81	$.88	$.98
20-20.9	.83	.90	1.00
21-21.9	.85	.92	1.02
22-22.9	.87	.94	1.04
23-23.9	.89	.96	1.06
24-24.0	.91	.98	1.08
25-25.9	.93	1.00	1.10
26-26.9	.95	1.02	1.12
27-27.9	.97	1.04	1.14
28-28.9	.99	1.06	1.16
29-29.9	1.01	1.08	1.18
30-30.9	1.03	1.10	1.20
31-31.9	1.05	1.12	1.22
32-32.9	1.07	1.14	1.24
33-33.9	1.09	1.16	1.26
34-34.9	1.11	1.18	1.28
35-35.9	1.13	1.20	1.30
36-36.9	1.15	1.22	1.32
37-37.9	1.17	1.24	1.34
38-38.9	1.19	1.26	1.36
39-39.9	1.21	1.28	1.38
40 and over	1.23	1.30	1.40

Note: Some schedules were effective March 31 instead of April 1. Applies to Anahuac, Angleton, Cedar Point, Fisher's Reef, Hull (new and old), Pierce Junction, Red Fish Reef, Turtle Bay, Thompsons (deep), Orange, Caplen, Turtle Bay and Jay Welder, since November 14. (Prior to May 21, Barbers Hill, Chacahoula and Hackberry fields were posted on above schedule but on that date were shifted to Gulf Coast schedule.)

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SOUTHWEST TEXAS FLAT-PRICE FIELDS

	Jan. 1	Mar. 29	May 21
Alfred and Magnolia City (Jim Wells County)	$1.08	$1.15	$1.35
Flour Bluff, East Flour Bluff	1.23	1.23	1.33
Luling	.87	.95	1.05
Lytton Springs	.99	1.07	1.17
Salt Flat, North Salt Flat, Darst Creek, Hibig, Clark, Carroll, and Zoborski	.96	1.04	1.14
Agua Dulce, Benavides, Longhorn, Southland, Sweden, Alice, Ben Bolt, Clark-Mull, Sun and Tom Graham	1.23	1.25	1.35
Rincon (North)		1.25	1.35

LA ROSA, TEXAS

Gravity—	Jan. 1	Mar. 29
Below 20	$0.82	$0.89
20-20.9	.83	.90
21-21.9	.84	.91
22-22.9	.85	.92
23-23.9	.86	.93
24-24.9	.87	.94
25-25.9	.88	.95
26-26.9	.89	.96
27-27.9	.90	.97
28-28.9	.91	.98
29-29.9	.92	.99
30-30.9	.93	1.00
31-31.9	.94	1.01
32-32.9	.95	1.02
33-33.9	.96	1.03
34-34.9	.97	1.04
35-35.9	.98	1.05
36-36.9	.99	1.06
37-37.9	$1.00	$1.07
38-38.9	1.01	1.08
39-39.9	1.02	1.09
40 and above	1.03	1.10

DICKINSON, TEXAS

Gravity—	Jan. 1	Mar. 29	May 21
Below 20	$.81	$.83	$.93
20-20.9	.83	.85	.95
21-21.9	.85	.87	.97
22-22.9	.87	.89	.99
23-23.9	.89	.91	1.01
24-24.9	.91	.93	1.03
25-25.9	.93	.95	1.05
26-26.9	.95	.97	1.07
27-27.9	.97	.99	1.09
28-28.9	.99	1.01	1.11
29-29.9	1.01	1.03	1.13
30-30.9	1.03	1.05	1.15
31-31.9	1.05	1.07	1.17
32-32.9	1.07	1.09	1.19
33-33.9	1.09	1.11	1.21
34-34.9	1.11	1.13	1.23
35-35.9	1.13	1.15	1.25
36-36.9	1.15	1.17	1.27
37-37.9	1.17	1.19	1.29
38-38.9	1.19	1.21	1.31
39-39.9	1.21	1.23	1.33
40 and above	1.23	1.25	1.35

Note: Applies to Dickinson, Hardin, League City, Rowan, Fairbanks, North Houston, Roslyn and Gillock after May 21, except that scale begins at "below 21°."

MIRANDO-DUVAL, TEXAS

Gravity—	Jan. 1	Mar. 29	May 21
Below 20	$.86	$.93	$1.03
20-20.9	.88	.95	1.05
21-21.9	.90	.97	1.07
22-22.9	.92	.99	1.09
23-23.9	.94	1.01	1.11
24-24.9	$.96	$1.03	$1.13
25-25.9	.98	1.05	1.15
26-26.9	1.00	1.07	1.17
27-27.9	1.02	1.09	1.19
28-28.9	1.04	1.11	1.21
29-29.9	1.06	1.13	1.23
30-30.9	1.08	1.15	1.25
31-31.9	1.10	1.17	1.27
32-32.9	1.12	1.19	1.29
33-33.9	1.14	1.21	1.31
34-34.9	1.16	1.23	1.33
35-35.9	1.18	1.25	1.35
36-36.9	1.20	1.27	1.37
37-37.9	1.22	1.29	1.39
38-38.9	1.24	1.31	1.41
39-39.9	1.26	1.33	1.43
40 and over	1.28	1.35	1.45

Note: Applies to Blanchard, Bridwell, Colorado, Comitas, Eagle Hill, Escobas, Fitzsimmons, Glen, Government Wells (North and South), Heyser, Hoffman, Kelsey, Kohler, Loma Novia, Lundell, Manila, Mirando Valley, Placedo, Randado, Sarnosa, Tesora, Lopez, Moco, Seven Sisters, South Seven Sisters, Conoco, Driscoll, O'Hern, Piedre Lumbre, Tarancahuas, Adami and Munson.

EDDY COUNTY, NEW MEXICO

Gravity—	Jan. 1	Mar. 29	May 30
28-28.9	$.61	$.68	$.88
29-29.9	.63	.70	.90
30-30.9	.65	.72	.92
31-31.9	.67	.74	.94
32-32.9	.69	.76	.96
33-33.9	.71	.78	.98
34-34.9	.73	.80	1.00
35-35.9	.75	.82	1.02
36-36.9	.77	.84	1.04
37-37.9	.79	.86	1.06
38-38.9	.81	.88	1.08
39-39.9	.83	.90	1.10
40 and above	.85	.92	1.12

Note: One schedule starts at 80 cents for crude below 25°.

WEST CENTRAL AND NORTH TEXAS

Gravity—	Jan. 1	Mar. 29	May 21	Dec. 11
24-24.9	$.71	...	...	$.89
25-25.9	.73	$.78	$.88	.91
26-26.9	.75	.80	.90	.93
27-27.9	.77	.82	.92	.95
28-28.9	.79	.84	.94	.97
29-29.9	.81	.86	.96	.99
30-30.9	.83	.88	.98	1.01
31-31.9	.85	.90	1.00	1.03
32-32.9	.87	.92	1.02	1.05
33-33.9	.89	.94	1.04	1.07
34-34.9	.91	.96	1.06	1.09
35-35.9	.93	.98	1.08	1.11
36-36.9	.95	1.00	1.10	1.13
37-37.9	.97	1.02	1.12	1.15
38-38.9	.99	1.04	1.14	1.17
39-39.9	1.01	1.06	1.16	1.19
40 and over	1.03	1.08	1.18	1.21

Note: Applies to Brown, Callahan, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton, Archer, Baylor, Clay, Coleman, Cooke, Foard, Jack, Montague, Palo Pinto, Wichita, Wilbarger and Young.

Some schedules begin at 28-28.9°, others at 21°.

Purchasers posted advances of 7 cents a barrel November 6 but rescinded the action on orders from OPA.

EAST CENTRAL TEXAS

Gravity—	Jan. 1	Mar. 29	May 21
23-23.9	$.78	...	...
24-24.9	.80	...	...
25-25.9	.82	$.87	$.97
26-26.9	.84	.89	.99
27-27.9	.86	.91	1.01
28-28.9	.88	.93	1.03
29-29.9	.90	.95	1.05
30-30.9	.92	.97	1.07
31-31.9	.94	.99	1.09
32-32.9	.96	1.01	1.11
33-33.9	.98	1.03	1.13
34-34.9	1.00	1.05	1.15
35-35.9	1.02	1.07	1.17
36-36.9	1.04	1.09	1.19
37-37.9	1.06	1.11	1.21
38-38.9	1.08	1.13	1.23
39-39.9	1.10	1.15	1.25
40 and over	1.12	1.17	1.27

Note: Applies to Anderson, Cherokee, Limestone, and Navarro counties. One schedule starts at 95 cents for below 25°.

RODESSA FIELD, CASS AND PANOLA COUNTIES, TEXAS, AND MILLER COUNTY, ARKANSAS

Gravity—	Jan. 1	Apr. 1	May 21
Below 25	$.73	$.78	$.88
25-25.9	.75	.80	.90
26-26.9	.77	.82	.92
27-27.9	.79	.84	.94
28-28.9	.81	.86	.96
29-29.9	.83	.88	.98
30-30.9	.85	.90	1.00
31-31.9	.87	.92	1.02
32-32.9	.89	.94	1.04
33-33.9	.91	.96	1.06
34-34.9	.93	.98	1.08
35-35.9	.95	1.00	1.10
36-36.9	.97	1.02	1.12
37-37.9	.99	1.04	1.14
38-38.9	1.01	1.06	1.16
39-39.9	1.03	1.08	1.18
40 and over	1.05	1.10	1.20

HAWKINS FIELD, TEXAS

Gravity—	Jan. 1	Apr. 1	May 21
Below 20		$.73	$.80
20-20.9		.75	.82
21-21.9		.77	.84
22-22.9		.79	.86
23-23.9		.81	.88
24-24.9		.83	.90
25-25.9		.85	.92

EAST TEXAS FLAT-PRICE FIELDS

Gravity—	Jan. 1	Apr. 1	May 21
East Texas	$1.10	$1.15	$1.25
Flag Lake	1.10	1.15	1.25
Van	.93	.96	1.08
Talco	.65	.72	.78
Cass County	1.05	1.10	1.20
Cayuga field	.78	.85	.90
Long Lake	1.08	1.13	1.23

Note: Some advances became effective April 1.

TEXAS GULF COAST

Gravity—	Jan. 1	Apr. 1	May 21
Below	$.86	$.96	$1.06
20-20.9	.88	.98	1.08
21-21.9	.90	1.00	1.10
22-22.9	.92	1.02	1.12
23-23.9	.94	1.04	1.14
24-24.9	.96	1.06	1.16
25-25.9	.98	1.08	1.18
26-26.9	1.00	1.10	1.20
27-27.9	1.02	1.12	1.22
28-28.9	1.04	1.14	1.24
29-29.9	1.06	1.16	1.26
30-30.9	1.08	1.18	1.28
31-31.9	1.10	1.20	1.30
32-32.9	1.12	1.22	1.32
33-33.9	1.14	1.24	1.34
34-34.9	1.16	1.26	1.36
35-35.9	1.18	1.28	1.38
36-36.9	1.20	1.30	1.40
37-37.9	1.22	1.32	1.42
38-38.9	1.24	1.34	1.44
39-39.9	1.26	1.36	1.46
40 and over	1.28	1.38	1.48

Note: Prices apply in Amelia, Clear Lake, Goose Creek, Hastings, Magnet, Mykawa (new), Raccoon Bend, South Thompsons, Sugarland, Thompsons, Webster, West Beaumont, High Island, Spindletop, Clinton, Louise, Ganado, Sour Lake, Lovells Lake, South Liberty, Big Creek, Blue Ridge, Fannett, Moore, Barbers Hill, Hankamer, Lochridge, Dyersdale, Hull (old), Batson (old), Bayou Blue, Chacahoula, Cotton Lake, Esperson (below 35°), Fausse Point, Greens Lake, East and West Hackberry, Hull (below 25°), Humble (below 35°), Nome, North Dayton (below 25°), Orange, Sarratoga, Sour Lake, Vinton, Arriola, Hamman, Hillje, Kubela, Manvel, Markham, Mauritz, Old Ocean, Pickett Ridge, Port Neches, West Columbia, Withers, and South Houston. Same schedules start at $1.08 below 21° and others terminate at $1.36 for 34°-34.9°.

TEXAS GULF COAST FLAT-PRICE FIELDS

	Jan. 1	Mar. 29	May 21
Clay Creek	$.85	$.90	$.100
Cleveland	1.14	1.16	1.26
Conroe	1.27	1.33	1.43
Batson (new), Fig Ridge, Hardin, Hull (25° and above), La Belle, North Dayton (25° and above), Seabreeze, South China, West Orange, Willow Slough, and Orange Bay	1.10	1.15	1.25
South Cotton Lake	1.18	1.23	1.35
Esperson (35° and above) and South Esperson	1.10	1.15	1.30
Livingston	1.10	1.15	1.25
Luby	...	...	1.35
Tomball and Satsuma	...	1.30	1.40
Goodrich (Dec. 1)	...	...	1.20

Note: Tomball and Satsuma fields were on a gravity basis until April 1, beginning at 95 cents for 22°-22.9°, with a 2-cent spread to 40° and over at $1.31.

SOUTH LOUISIANA

Gravity—	Jan. 1	Apr. 1	May 22
Below 21	$.75	$.80	$.90
21-21.9	.77	.82	.92
22-22.9	.79	.84	.94
23-23.9	.81	.86	.96
24-24.9	.83	.88	.98
25-25.9	.85	.90	1.00
26-26.9	.87	.92	1.02
27-27.9	.89	.94	1.04
28-28.9	.91	.96	1.06
29-29.9	.93	.98	1.08
30-30.9	.95	1.00	1.10
31-31.9	.97	1.02	1.12
32-32.9	.99	1.04	1.14
33-33.9	1.01	1.06	1.16
34-34.9	1.03	1.08	1.18
35-35.9	1.04	1.10	1.20
36-36.9	1.05	1.12	1.22
37-37.9	1.06	1.14	1.24
38-38.9	1.07	1.16	1.26
39-39.9	1.08	1.18	1.28
40 and over	1.09	1.20	1.30

Note: Applies to Bayou Mallett, Choc-

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UNIVERSITY (BATON ROUGE), LOUISIANA

Gravity—	Jan. 1	Apr. 1	May 22
Below 21	$.91	...	...
21-21.9	.93	...	...
22-22.9	.95	...	...
23-23.9	.97	...	...
24-24.9	.99	...	...
25-25.9	1.01	...	...
26-26.9	1.03	...	...
27-27.9	1.05	...	...
28-28.9	1.07	...	...
29-29.9	1.09	...	...
30-30.9	1.11	$1.16	$1.26
31-31.9	1.13	1.18	1.28
32-32.9	1.15	1.20	1.30
33-33.9	1.17	1.22	1.32
34-34.9	1.19	1.24	1.34
35-35.9	1.20	1.26	1.36
36-36.9	1.21	...	...
37-37.9	1.22	...	...
38-38.9	1.23	...	...
39-39.9	1.24	...	...
40 and above	1.25	...	...

IOWA DISTRICT, LOUISIANA

		May
Below 18	$.75	...
18-18.9	.77	$.80
19-19.9	.79	.82
Below 20	...	$.99
20-20.9	.81	.84
21-21.9	.83	.86
22-22.9	.86	.88
23-23.9	.89	.91
24-24.9	.92	.94
25-25.9	.95	.97
26-26.9	.98	1.00
27-27.9	1.00	1.03
28-28.9	1.02	1.05
29-29.9	1.04	1.07
30-30.9	1.06	1.09
31-31.9	1.08	1.11
32-32.9	1.10	1.13
33-33.9	1.12	1.15
34-34.9	1.14	1.17
35-35.9	...	1.19

Note: Applies to Iowa, Black Bayou, and White Castle, except that its April 1 schedule for Black Bayou and White Castle started at "below 21°" at 84 cents. Schedule in Gibson, South Houma, Hester, and West Lake Verret fields runs 10 cents higher per degree of gravity effective May 21.

ABBEVILLE, LOUISIANA

Gravity—	Jan. 1	Apr. 1	May 21
Below 36	$.92	$.97	$1.07
36-36.9	.94	.99	1.09
37-37.9	.96	1.01	1.11
38-38.9	.98	1.03	1.13
39-39.9	1.00	1.05	1.15
40 and over	1.02	1.07	1.17

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MIDDLE WEST FLAT-PRICE FIELDS

	Jan. 1	Jan. 2	Jan. 16	Apr. 1	Apr. 28	May 1	May 21	May 27	June 19
Illinois, Indiana, and Ohio									
Illinois basin	$1.15	....	....	....	$1.27	....	$1.37	....	....
Eastern Illinois	1.00	....	....	....	1.12	....	1.22	....	....
Western Indiana	1.00	....	....	....	1.12	....	1.22	....	....
Carmi-Storms, Illinois	1.05	....	$1.10	....	1.22	....	1.32	....	....
Lima, Ohio	.90	....	....	$1.05	....	....	....	$1.17	....
Michigan									
Greendale, Porter, Vernon, Crystal, and Wise	1.12	$1.22	....	1.27	....	$1.37	....	1.44	....
Buckeye, Bentley, Edenville, Beaverton, and Monitor (sweet)	1.10	1.20	....	1.25	....	1.35	....	1.42	....
Freeman, Redding, Lincoln, and Winterfield	1.07	1.17	....	1.22	....	1.32	....	1.39	....
Hamilton-Grout	.97	1.07	....	1.12	....	1.22	....	1.29	....
West Branch, Clayton, Ogemaw, and Arenac	.92	1.02	....	1.07	....	1.17	....	1.24	....
Adams	1.05	1.05	....	1.10	....	1.20	....	1.27	....
Bloomingdale-Columbia	1.18	1.18	1.23	1.28	....	1.38	....	1.38	....
Kent County	1.18	1.18	1.23	1.28	....	1.38	....	1.38	....
Sherman	1.07	1.17	....	1.22	....	1.32	....	1.39	....
Midland (Midland County)	1.22	1.22	....	1.27	....	1.37	....	1.44	....
Kentucky									
Big Sandy River	1.12	....	....	1.17	....	....	1.32	....	$1.38
Kentucky River	1.20	....	....	1.25	....	....	1.40	....	1.43
Birk City and Corydon	1.10	....	....	....	1.22	....	1.32	....	....
Owensboro	1.10	....	....	....	1.22	....	1.32	....	....
Western Kentucky	1.10	....	....	....	1.22	....	1.32	....	....

PENNSYLVANIA GRADE CRUDE PRICES

	Jan. 1	Jan. 27	Apr. 23	May 20	May 21	May 27	June 18*
Bradford, Pa.	$2.15	$2.30	$2.40	$2.40	$2.55	$2.55	$2.75
Allegany, N. Y.	2.15	2.30	2.40	2.40	2.55	2.55	2.75
Pennsylvania Grade oil in National Transit lines (Bradford field)	2.15	2.30	2.40	2.40	2.55	2.55	2.75
Pennsylvania Grade oil in Southwest Pennsylvania lines	1.80	1.95	2.05	2.05	2.20	2.20	2.40
Pennsylvania Grade oil in Eureka Pipe Line lines	1.74	1.89	1.99	1.99	2.14	2.14	2.34
Corning Grade oil in Buckeye Pipe Line Co. lines	1.12	1.12	†1.17	†1.24	1.24	1.31	1.31
Pennsylvania Grade oil in National Transit lines:							
Group A: Includes Cochran, Franklin, Hamilton, and Doolittle	2.08	2.23	2.33	2.33	2.48	2.48	2.68
Group B: Includes Titusville district	2.07	2.22	2.32	2.32	2.47	2.47	2.67
Group C: Includes Turkey and Tidioute districts	2.06	2.21	2.31	2.31	2.46	2.46	2.66
Group D: Includes Bear Creek and Porkey districts	2.05	2.20	2.30	2.30	2.45	2.45	2.65
Grade E: Includes Edeneau, Bull Creek, Rough Run, Carbon, Dipner, Bredin, McJunkin, Kenerdell, Emlenton, Tiona, Lacy, and Kinzau districts. Price depends on length of pipe line to plant at Oil City	2.03	2.18	2.28	2.28	2.43	2.43	2.63
Pennsylvania Grade oil in Buckeye Pipe Line Co. lines	1.70	1.85	1.95	1.95	2.10	2.10	2.30
Pennsylvania Grade oil in Eureka Pipe Line Co. lines	1.74	1.89	1.99	1.99	2.14	2.14	2.34
West Virginia	1.74	1.89	1.99	2.14	2.14	2.14	2.34

*Advance of 23 to 25 cents per barrel, effective August 23, was rescinded by order of OPA.
†Advanced 5 cents April 1 and 7 cents May 2.

WEST TEXAS FLAT-PRICE FIELDS

	Jan. 1	Mar. 1	Mar. 29	May 21
Yates (shallow), Pecos County	$.65	....	$.72	$.82
Pecos County and Yates (regular)	.78	....	.85	.95
Hockley and Cochran counties*	....	$.70	.77	.87

*These counties included in West Texas gravity table by some buyers.

ROANOKE AND CHALKLEY, LOUISIANA

Gravity—	Jan. 1	Apr. 1	May 20
18-18.9	...	$.75	...
19-19.9	...	.77	...
Below 20	...	...	$.94
20-20.9	$.75	.79	.96
21-21.9	.77	.81	.98
22-22.9	.79	.83	1.00
23-23.9	.81	.86	1.02
24-24.9	.83	.89	1.04
25-25.9	.85	.92	1.06
26-26.9	.87	.95	1.08
27-27.9	.89	.98	1.10
28-28.9	.91	1.00	1.12
29-29.9	.93	1.02	1.14
30-30.9	.95	1.04	1.16
31-31.9	.97	1.06	1.18
32-32.9	.99	1.08	1.20
33-33.9	1.01	1.10	1.22
34-34.9	1.03	1.12	1.24
35-35.9	1.04	1.14	...

EAST AND WEST HACKBERRY, LOUISIANA

Gravity—	Jan. 1	Apr. 1	May 21
Below 20	$.86	$.96	$1.06
20-20.9	.88	.98	1.08
21-21.9	.90	1.00	1.10
22-22.9	.92	1.02	1.12
23-23.9	.94	1.04	1.14
24-24.9	.96	1.06	1.16
25-25.9	.98	1.08	1.18
26-26.9	1.00	1.10	1.20
27-27.9	1.02	1.12	1.22
28-28.9	1.04	1.14	1.24
29-29.9	1.06	1.16	1.26
30-30.9	1.08	1.18	1.28
31-31.9	1.10	1.20	1.30
32-32.9	1.12	1.22	1.32
33-33.9	1.14	1.24	1.34
34-34.9	1.16	1.26	1.36

Note: Also applies to Edgerly, Storks, Vinton, East Hackberry, Cameron Meadows, Leesville, Timbalier Bay, Grand Bay, Quarantine Bay, and West Bay.

EVANGELINE AND JENNINGS, LOUISIANA

Gravity—	Jan. 1	Apr. 1	May 21
31-31.9	$.87	$.97	$1.07
32-32.9	.89	.99	1.09
33-33.9	.91	1.01	1.11
34-34.9	.93	1.03	1.13
35-35.9	.95	1.05	1.15
36-36.9	.97	1.07	1.17
37-37.9	.99	1.09	1.19
38-38.9	1.01	1.11	1.21
39-39.9	1.03	1.13	1.23
40 and over	1.05	1.15	1.25

Note: Prices in Delta Farm, Lake Salvador, and Golden Meadow adopted May 21, take same schedule except beginning 1° lower at $1.05.

LOCKPORT, CAMERON MEADOWS AND WEST GUEYDAN, LOUISIANA

Gravity—	Jan. 1	Apr. 1	May 21
18-18.9	$.74	$.84	$.94
19-19.9	.76	.86	.96
20-20.9	.78	.88	.98
21-21.9	.80	.90	1.00
22-22.9	.82	.92	1.02
23-23.9	.85	.95	1.05
24-24.9	.88	.98	1.08
25-25.9	.91	1.01	1.11
26-26.9	.94	1.04	1.14
27-27.9	.97	1.07	1.17
28-28.9	.99	1.09	1.19
29-29.9	1.01	1.11	1.21
30-30.9	1.03	1.13	1.23
31-31.9	1.05	1.15	1.25
32-32.9	1.07	1.17	1.27
33-33.9	1.09	1.19	1.29
34-34.9	1.11	1.21	1.31
35-35.9	1.13	1.23	1.33

GUEYDAN, LOUISIANA*

Gravity—	Jan. 1	Apr. 1	May 20
Below 20	$.86	...	...
20-20.9	.88	$.90	$.90
21-21.9	.90	.92	.92
22-22.9	.92	.94	.94
23-23.9	.94	.96	.96
24-24.9	.96	.98	.98
25-25.9	.98	1.00	1.00
26-26.9	1.00	1.02	1.02
27-27.9	1.02	1.04	1.04
28-28.9	1.04	1.06	1.06
29-29.9	1.06	1.08	1.08
30-30.9	1.08	1.10	1.10
31-31.9	1.10	1.12	1.12
32-32.9	1.12	1.14	1.14
33-33.9	1.14	1.16	1.16
34-34.9	1.16	1.18	1.18
35-35.9	1.18	1.20	1.20
36-36.9	1.20	1.22	1.22
37-37.9	1.22	...	...
38-38.9	1.24	...	...
39-39.9	1.26	...	...
40 and over	1.28	...	...

Note: Effective January 22, were flat prices of $1.03 for Gueydan light crude and 89 cents for heavy crude, but on April 1 returned to gravity basis.

*Applies since May 15 in Bateman Lake, Dog Lake, Fausse Point, Horseshoe Bayou, Jefferson Island, Plumb Bob, Vermillion Bay, West Cote Blanche and Delta Duck Club fields, except starting at 28-28.9° and ending at 36-36.9°.

MISSISSIPPI

Tinsley Field

Effective October 16, schedule posted ranging from 74.5 cents for 24-24.9° with 2-cent increments for each higher degree to $1.065 for 40° and above.

LOUISIANA AND ARKANSAS FLAT-PRICE FIELDS

	Jan. 1	Apr. 1	May 21
Tepetate and Lake Arthur, La.	$1.03	$1.08	$1.18
Ville Platte, La.	1.03	1.10	1.20
Smackover (heavy), Ark.	.73	.76	.83
Big Creek, Dorcheat, McKamie (sour), Ark.	.95	1.05	1.15
Tullos-Urania, Ark.	.89	1.05	1.15
Cotton Valley distillate (above 60°)	1.10	1.20	1.30
Cotton Valley (Hollaway sand), La.	1.10	1.15	1.25
Cotton Valley (Bodcaw-D sands), La.	1.05	1.10	1.20
Bosco, La.	.93	1.04	1.14
Sweet Lake, La.	(*)	.96	1.06
Creole, La.	.96	1.06	1.16
Nevada County, Ark	...	.60	.80
Happytown, La.	1.00	1.05	1.15
Garden Island, La.	1.24	1.26	1.36
Lafitte, Paradise, La.	1.04	1.09	1.19

Note: Tullos and Urania crudes advanced from 89 to 95 cents on January 3. Nevada County crude advance effec-

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tive June 2 instead of May 21. *Sweet Lake crude on January 1 took Gueydan gravity-table basis.

ATLANTA, BUCKNER, MAGNOLIA, SCHULER (JONES SAND), VILLAGE AND LEWISVILLE FIELDS, ARKANSAS

Gravity—	Jan. 1	Apr. 1	May 22
Below 21	$.55	$.58	$.68
21-21.9	.57	.60	.70
22-22.9	.59	.62	.72
23-23.9	.61	.64	.74
24-24.9	.63	.66	.76
25-25.9	.65	.68	.78
26-26.9	.67	.70	.80
27-27.9	.69	.72	.82
28-28.9	.71	.74	.84
29-29.9	.73	.76	.86
30-30.9	.75	.78	.88
31-31.9	.77	.80	.90
32-32.9	.79	.82	.92
33-33.9	.81	.84	.94
34-34.9	.83	.86	.96
35-35.9	.84	.88	.98
36-36.9	.85	.90	1.00
37-37.9	.86	.92	1.02
38-38.9	.87	.94	1.04
39-39.9	.88	.96	1.06
40 and over	.89	.98	1.08

Note: One schedule starts at 76 cents for oil below 25°.

NORTH LOUISIANA AND ARKANSAS

Schedule 1

Gravity—	Jan. 1	Apr. 1	May 22
Below 25	$.73	$.76	$.86
25-25.9	.75	.78	.88
26-26.9	.77	.80	.90
27-27.9	.79	.82	.92
28-28.9	.81	.84	.94
29-29.9	.83	.86	.96
30-30.9	.85	.88	.98
31-31.9	.87	.90	1.00
32-32.9	.89	.92	1.02
33-33.9	.91	.94	1.04
34-34.9	.93	.96	1.06
35-35.9	.94	.98	1.08
36-36.9	.95	1.00	1.10
37-37.9	.96	1.02	1.12
38-38.9	.97	1.04	1.14
39-39.9	.98	1.06	1.16
40 and over	.99	1.08	1.18

Note: Applies to Caddo, De Soto, Sabine, Fouke, Homer, Miller County, Sugar Creek, Nebo, El Dorado, West and South Rainbow, Snow Hill and Morgan sand of Schuler field.

Schedule 2

Gravity—	Jan. 1*	Apr. 1	May 22
Below 25		$.78	$.88
25-25.9		.80	.90
26-26.9		.82	.92
27-27.9		.84	.94
28-28.9		.86	.96
29-29.9		.88	.98
30-30.9		.90	1.00
31-31.9		.92	1.02
32-32.9		.94	1.04
33-33.9		.96	1.06
34-34.9		.98	1.08
35-35.9		1.00	1.10
36-36.9		1.02	1.12
37-37.9		1.04	1.14
38-38.9		1.06	1.16
39-39.9		1.08	1.18
40 and above		1.10	1.20

*Posted at flat price of $1.05 per bbl.

Note: Applies to Cotton Valley (crude), Rodessa, Shreveport (Cross Lake), Haynesville, and Miller County, Arkansas, to Caddo, Homer, Bull Bayou and Crichton.

BUNKIE, EOLA, OLLA, AND SOUTH OLLA, LOUISIANA

Gravity—	Jan. 1	Apr. 1	May 22
Below 25	$.83	$.88	$.98
25-25.9	.85	.90	1.00
26-26.9	.87	.92	1.02
27-27.9	.89	.94	1.04
28-28.9	.91	.96	1.06
29-29.9	.93	.98	1.08
30-30.9	.95	1.00	1.10
31-31.9	.97	1.02	1.12
32-32.9	.99	1.04	1.14
33-33.9	1.01	1.06	1.16
34-34.9	1.03	1.08	1.18
35-35.9	1.04	1.10	1.20
36-36.9	1.05	1.12	1.22
37-37.9	1.06	1.14	1.24
38-38.9	1.07	1.16	1.26
39-39.9	1.08	1.18	1.28
40 and over	1.09	1.20	1.30

ROCKY MOUNTAIN GRAVITY TABLE

Gravity—	Jan. 1	Apr. 1	May 20
Below 29	$.86	$.86	$.96
29-29.9	.88	.88	.98
30-30.9	.90	.90	1.00
31-31.9	.92	.92	1.02
32-32.9	.94	.94	1.04
33-33.9	.96	.96	1.06
34-34.9	.98	.98	1.08
35-35.9	1.00	1.00	1.10
36-36.9	1.02	1.02	1.12
37-37.9	1.04	1.04	1.14
38-38.9	1.06	1.06	1.16
39-39.9	1.08	1.08	1.18
40 and above	1.10	1.10	1.20

Note: Applies to Fort Collins and Wellington fields of Colorado; in Dutton Creek, Midway and Salt Creek (except Tensleep crude), and Lost Soldier fields of Wyoming.

Wyoming

	Jan. 1	Apr. 1	May 20	July 1
Rock Creek	$1.00	$1.05	$1.15	
Lance Creek	.77	.82	.92	$1.12
Elk Basin	.90	.90	1.00	
Frannie (light)	.55	.65	.70	
Frannie (heavy)	.42	.42	.47	
Grass Creek (light)	.90	.90	1.00	
Grass Creek (heavy)	.40	.45	.50	
Homilton Dome	.35	.40	.45	
Big Muddy	.98	.98	1.08	
Salt Creek (Tensleep crude)	.646	.6515	.6785	

Colorado

Gravity—	Jan. 1	Apr. 1	May 20
Canon City and Florence	$.90	$.95	$1.05
Illes	.92	.97	1.07

Montana

Dry Creek	$.92	$.92	$1.02
Cut Bank	1.00	1.00	1.00
Cat Creek	1.10	1.15	1.15
Sunburst-Kevin	.80	.90	1.00

CANADIAN FIELDS

Ontario

	Jan. 1
Petrolia	$2.10
Oil Springs	2.17

Turner Valley

Turner Valley prices raised 27 cents, effective July 16 from $1.08 for 33-33.9° with a 2-cent spread to $1.70 for 64° and above to spread of $1.35 to $1.97.

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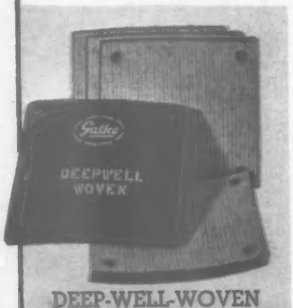
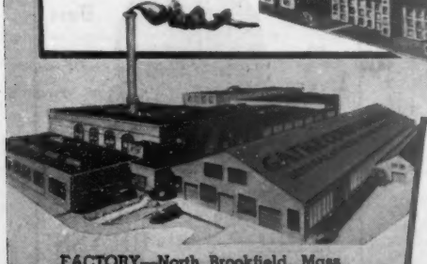


DEEP-WELL-WOVEN ASBESTOS BRAKE BLOCKS

FACTORY—Warsaw, Ind.



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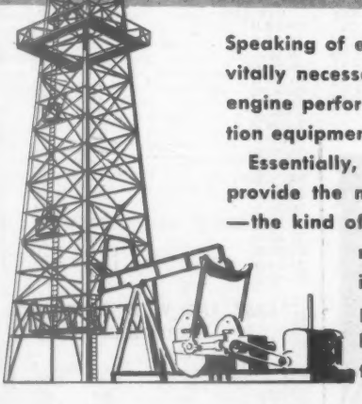

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Personal Paragraphs

HARRY NORRIS, scout for Sinclair Prairie Oil Co., has been returned to Oklahoma City, and will cover the northwestern Oklahoma area. He was transferred from Parco, Wyo.

E. R. BRANN, of the Office of Petroleum Coordinator, Houston, Tex., and JOSEPH L. McHUGH, Conservation Commissioner for the State of Louisiana, met recently with representatives of Louisiana's oil-and-gas-producing industry to map plans for the forming of committees for each field in the state, with aims at furthering cooperation with the OPC.

JOHN B. CARTER, independent operator, has returned to Houston, Tex., from Illinois, and is reopening his office in Houston, where he will continue to operate independently.

EDMUND WINGFIELD, New Orleans, La., has been appointed administrative superintendent of the Freeport Sulphur Co., and will make his headquarters at New Orleans.

E. C. PARKER, JR., petroleum engineer for Stanolind Oil & Gas Co. in its division offices at Fort Worth, Tex., has been ordered to report for active duty on February 1 at Fort Sill, Okla. Mr. Parker holds a second lieutenancy in the field artillery reserve.

HAROLD E. MASSEY, engineer, Cities Service Oil Co., has been fitted out with an army uniform, and has left for a California post. G. T. McINTYRE, geologist with Cities Service, has also been called up for the Army.

SHERMAN DOTY, supervisor of operations of the manufacturing department of Union Oil Co., has been transferred to the marine department, replacing A. L. QUACKENBOSS, who has been appointed chairman of a committee to allocate and route all tankers on the Pacific Coast during the present emergency.

J. A. McCARTY, independent oil operator, was named president of the North Texas Oil and Gas Association at a meeting of the board of directors early this week. He succeeds C. J. TUCKER. FRED SEHMANN was chosen first vice president, HOMER LEE was chosen second vice president, and D. G. GRAY was reelected executive vice president.

A. J. DOUGLAS has been elected president of Esther Oil Co., Bradford, Pa. Other officers named at a recent stockholders' meeting were JAMES R. EVANS, vice president; E. J. CONWELL, vice president, and C. M. BROODER, treasurer.

STANLEY LEARNED, assistant manager of the gasoline pipe-line department of Phillips Petroleum Co., Bartlesville, Okla., was elected president of the Oklahoma Society of Professional Engineers at a meeting held in Tulsa last week. CHARLES LARKEY, Sinclair Prairie Oil Co., Tulsa, was elected a director.

T. C. MILLER, production foreman of the Yorba district for General Petroleum Corp., has retired after 25 years of service in the company's production and engineering departments in California. His position has been taken by A. W. TITUS, who has been transferred from position of production foreman at Signal Hill. J. H. NOBLE, well-pulling foreman at Santa Fe Springs, has been promoted to position of production foreman and is making headquarters at Wilmington.

Shifts: JACK GREENE, engineer, Gulf Petroleum Corp., Crane, Tex., to Magnolia Petroleum Co., Houston, Tex.; PAUL W. WITTMAN, superintendent, Stewarts Co., Galveston, Tex., to Houston, Tex.; J. F. SCOTT, engineer, Carter Oil Co., Magnolia, Ark., to Shreveport, La.; C. A. BENSON, engineer, Phillips Petroleum Co., Smackover, Ark., to El Dorado, Ark.; W. B. HOGG, engineer, National Geophysical Co., El Dorado, Ark., to Hope, Ark.; M. R. JOY, engineer, Cities Service Oil Co., Mount Pleasant, Mich., to Carmi, Ill.; TOM GERALD, Noble Drilling Co., Mount Vernon, Ind., to Apache, Okla.; L. D. VONDE VELD, drilling contractor, Ponca City, Okla., to Tulsa; J. W. BARTLETT, superintendent, American Liberty Oil Co., Grapeland, Tex., to Blessing, Tex.; S. W. WEATHERBY, engineer, Independent Exploration Co., Houston, Tex., to Tulsa.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

If Japanese plans work out, the oil business of the Orient is to be largely participated in by the enterprising Nipponese. They have obtained a concession of 30,000 sq. miles in the British Borneo for oil-producing purposes.

Doherty interests have leased office room in Kansas City and Henry L. Doherty is quoted as saying that eventually all of the business for the Southwest will be centered at Kansas City.

Hugh O'Donnell, one of the first big operators in the Lawrence, Ill., district, died at Vincennes, Ind., recently as the result of injuries suffered several days previously.

20 YEARS AGO

Stating that it is the belief of the Government that the law governing the lease for exploration of oil lands in the Philippines is less liberal to foreigners than it is in America, Governor General Wood is recommending amendment of the law.

Numerous interesting angles of the filling station and country delivery phases of the refined-oil business were presented at a recent meeting of the Oklahoma Oil Jobbers' Association at Oklahoma City by L. A. Warren of Marland Refining Co.

Murray M. Doan, formerly vice president of the Gypsy Oil Co., has resigned as general manager of the Phillips Petroleum Co. of Bartlesville, Okla.

10 YEARS AGO

A standardized motor fuel, utilizing a large proportion of domestic gasoline, benzol, and alcohol, with unified control over all filling stations in the country, is contemplated by the German Government, according to reports from Berlin.

Joseph M. Logue, 48, died in El Dorado, Kans., January 16 after a 10-day illness. Mr. Logue had been district superintendent for the Magnolia Petroleum Co. in the Butler County fields for over 13 years.

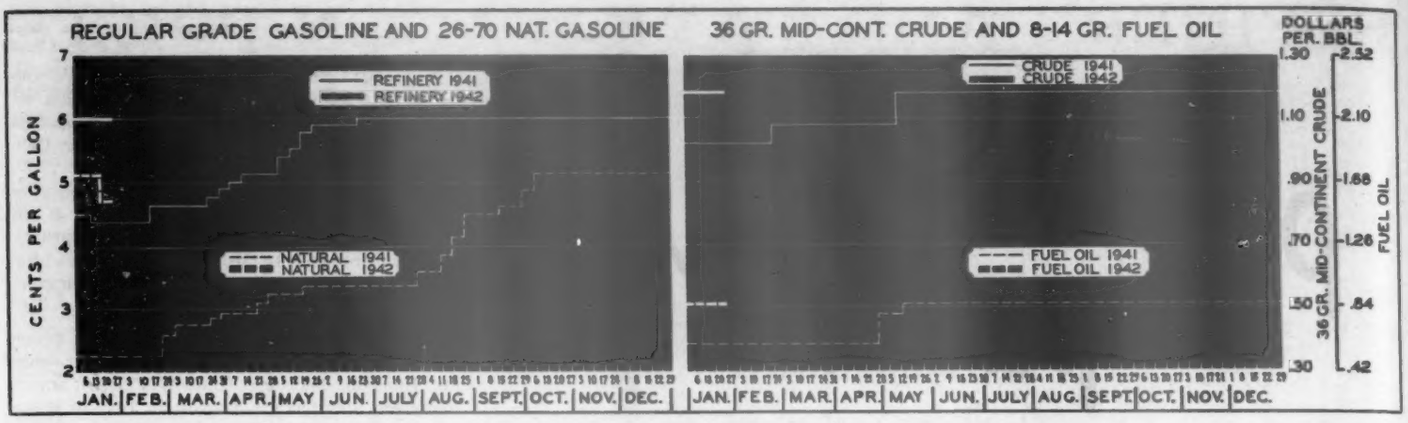
JAMES N. GREGORY, who has been assistant engineer in the field department of Shell Oil Co., Inc., at Long Beach, Calif., has been promoted to engineer and transferred to the engineering and survey department at the Los Angeles office.

W. R. DONAHUE, January program chairman of the Taft chapter of the California Natural Gasoline Association, had as his guest speaker last week, EDWARD NELSON, lubrication engineer of General Petroleum Corp., whose headquarters are at the Vernon laboratory.

THOMAS MIDGLEY, JR., discoverer of tetraethyl lead, is the winner of the 1942 Willard Gibbs Medal of the American Chemical Society. He was cited for "discoveries which are outstanding from the standpoint of pioneering in new fields and from the standpoint of commercial importance."

J. J. CONRY, former president of Carter Oil Co., whose appointment as a member of the Tulsa County tire-rationing board was reported in these columns recently, has tendered his resignation to become effective as soon as a new member is appointed. Ill health is given as the cause of Mr. Conry's giving up his duties.

E. B. MILLER, petroleum engineer for Tide Water Associated Oil Co. formerly stationed at Kilgore, Tex., has been transferred to Wichita Falls, Tex., as engineer in charge of properties recently purchased by the company in the K.M.A. field and other North Texas pools. J. E. BAILEY has been transferred from the company's Houston, Tex., offices to take over Mr. Miller's former duties.



MARKET DEVELOPMENTS . . .

East Coast

NEW YORK, Jan. 27.—OPA permission to increase prices as a partial offset to increased transportation costs was forthcoming last week for East Coast oil companies and accordingly gasoline prices, including all methods of delivery, were advanced 0.3 cent. The advance was effective throughout the 15-state northeastern area north of South Carolina and including West Virginia and Pennsylvania as well as the District of Columbia.

Approval of OPA for the advance had been expected in view of the increasing use of high-cost tank-car transportation and the willingness of the companies to make even further use of this method as advocated by the OPC. Since other products are also affected by the higher costs, it is believed in some quarters that similar advances in heating oil and kerosene may also be permitted. Prices of these products, particularly those of kerosene, have not shown the advance over last year's levels that has characterized the motor-fuel market.

The advance for gasoline raises the New York Harbor quotation of 72-74 octane material to 8.3 cents. This was the first change in this market in more than 6 months. Dealer tank-wagon prices now range from a low of 9.5 cents in the highly competitive Albany, N. Y., and Boston, Mass., areas to a high of 12.25 cents in Hickory, N. C.

Current prices in many instances are lower than they would be under normal circumstances. Demand for motor fuel has been well sustained despite adverse weather and tire rationing while residual fuel oil and heating-oil requirements are reported at an all-time peak in the northeastern area. Demands for both heavy and light fuel oil have been so strong that talk of rationing has become increasingly prominent.

Transportation difficulties now are viewed with more concern than they were last summer for the heaviest demand for petroleum products of the entire year is experienced in winter when the gain in fuel-oil demand offsets the decline in motor-fuel demand.

Heavy demand on one hand and lack of transportation facilities on the other are continuing to reduce East Coast stocks at a sharp rate. Total reduction in both heavy and light fuel-oil stocks in the week ended January 10 was almost 3,000,000 bbl., bringing light stocks almost to a parity with those of a year ago and dropping residuals under last year's levels.

Mid-Continent

FIRST impacts of the rubber-conservation order on demand for motor fuel were striking this week at the Mid-Continent refinery-gasoline market. Part of the shrinkage in motor-fuel demand may be attributed to freezing weather and snow in northern states during the earlier part of January; however, local demand is reported to have slumped and, consequently, this trend is accepted by most refiners as a more accurate barometer of consuming conditions than the usually reliable temperature charts.

Normally, an interval of inclement weather in the Middle West consuming states is followed in about 2 weeks by a slump in shipping instructions to refineries. This normal lag is caused by accumulation of supplies on the consuming end during the period that driving is curtailed and the reaction of distributors in reducing receipts of products until inventories are liquidated to working levels.

The first reduction in natural-gasoline prices in more than a year developed during the week. Since the middle of November 1940 the trend of natural gasoline prices had been constantly upward until the reduction last week. Interruptions in Atlantic coastwise tanker movement caused by a shortage of boats and submarine attacks have caused stocks to accumulate on the Gulf Coast to a burdensome extent. Furthermore, inland refiners are reported long on low-octane stocks, forcing a more conservative policy in outside purchases of natural gasoline.

Quotations on 26-70 grade natural gasoline in Oklahoma for northern shipment declined to a range of 4.75 to 4.875 cents per gallon during the week. North Texas quotations fell a corresponding amount and the market there is now 4.5 to 4.625 cents.

Northern movement of kerosene and distillate fuel oils continued at a moderate rate. The break in temperatures in Minnesota, Wisconsin, Michigan, northern Illinois and other northern states has precipitated a temporary lull in the activity of heating-oil buyers. Demand continues to exceed available supplies of residual fuel oil, although the Mid-Continent has not been a large interstate shipper of heavy burning stocks for several years.

Sentence Summaries

MID-CONTINENT: Refinery-gasoline shipments slump. Prices sustained at unchanged levels.

EAST COAST: General advance of 0.3 cent per gallon authorized in seaboard states.

GULF COAST: Interruption of tanker voyages slackens coastwise movement.

PACIFIC COAST: Markets unsettled, demand lags, transportation in snarl.

PENNSYLVANIA: Demand and prices for lubricating oils are holding firm.

A.P.I. REFINERY REPORT

(Figures in thousands of barrels)

(Week ended January 17)

	Dly. crude runs to stills	Stocks: Gasoline	Residual	Gas oil
East Coast	565	20,361	10,109	15,742
Appalachian	150	3,868	502	359
Ind., Ill., Ky.	673	19,303	4,203	4,266
Okla., Kans., Mo.	370	9,286	2,151	1,117
Inland Texas	180	3,348	1,409	105
Texas Gulf	966	16,255	9,047	8,173
Louisiana Gulf	156	3,632	2,416	1,537
No. La. & Ark.	84	835	380	61
Rockies	102	1,934	626	296
California	477	16,815	61,860	12,328
Total Jan. 17, 1942	3,723	95,817	92,703	43,984
Total Jan. 10, 1942	3,891	94,204	94,885	47,250
Total Jan. 18, 141	3,805	86,929	99,292	40,378

Note: Daily refinery runs and product stocks for week ended January 24, 1942, appear on Trends page.

CRUDE-OIL STOCKS

(Bureau of Mines Estimate)

Week ended:	Bbl. of crude*
January 17, 1942	246,267,000
January 10, 1942	244,364,000
January 18, 1941	259,934,000

*Does not include heavy, unrefinable California crude.

Gulf Coast

HOUSTON, Tex., Jan. 27.—Increased offerings of gasoline coupled with growing uncertainties of transportation are causing some concern in Gulf Coast refinery markets. There is no definite break in the market although one seller is reported to have offered a cargo of 72-74 octane material below 6 cents which is at least 0.25 cent below previous nominally quoted levels. Marketers now claim that sellers no longer have the control over the market they have had for the past several months.

The transfer of tankers to the Pacific Coast, coupled with the hazards developing in Atlantic coastwise trade, is threatening Gulf Coast refiners with a return to the situation that existed early last year. For several weeks there has been some backing up of material on the Gulf Coast, and it now is expected that the availability of tankers and development of inland transportation routes once again is to become a major factor.

Several sales of No. 2 fuel at prices below prevailing quotations that have existed for some time is indicating a weakness in this market. There is no verification of the price at which this material moved, and suppliers still are quoting a low of 4 cents. Buyers indicate that No. 2 fuel can be bought at 3.875 cents.

Kerosene is maintaining its strength. Supplies are scarce. Several sources have limited supplies and are not anxious to sell. Stocks are held for a minimum of 4.25 cents for prompt shipment. No sales were reported during the week.

Bunker C and other heavy fuels continue firm at ceiling prices.

REFINERY AND TANK-WAGON PRICES

(Prices as of January 27)

Refinery Gasoline

Octane (A.S.T.M.):	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*	.....	.....	6.000-6.250	.....	5.625-5.875	5.250-5.500
Pennsylvania	7.750-8.000	6.750-7.000	6.750-7.000	.....	.....	.....
Gulf Coast	6.625-6.875	.....	6.250-6.375	6.250-6.500	.....	.....
Northeast Coast	8.800	.....	8.300	8.300	.....	.....
Pacific Coast	7.000-7.500	.....	6.625-6.875	.....	6.375-6.500	.....

*Basis Oklahoma Group 3.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(375-390)
Oklahoma	4.750	5.625-5.875	
North Texas	4.500	5.250-5.375	.....
North Louisiana	4.500	5.250-5.375	
California			4.500-5.000

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Oklahoma	.....	.....	4.500-4.750	4.375-4.625	.....
North Louisiana			4.375-4.500	.....	.....
Pennsylvania	6.250-6.500	6.375-6.725	.....	.....	.....
California	.....	.....	.....	4.500-6.000	4.500-5.000
Northeast Coast	.....	.....	.....	5.300	.....
Gulf Coast	.....	.....	.....	4.250-4.500	.....

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48°G.	24 D.I.	48-52 D.I.	58&above	Diesel bunkers	Bunker C
Mid-Continent	4.125-4.250	.....	.....	.....	.....	.....
California	.....	2.750-4.000	.....	.....	.....	$0.75-85
Gulf Coast	.....	.....	4.125-4.250	4.250-4.375	$1.45	0.85
Northeast Coast	.....	.....	.....	5.200	2.15	1.35
North Louisiana	.....	.....	.....	.....	.....	*0.80-0.85

*10-14° gravity.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent	3.6-3.8	3.5-3.7	$0.85-90	$0.85-90
Pennsylvania (West)	5.6-6.0	5.5-6.0	*5.5-5.875	.....
Northeast Coast	5.2	5.2	$1.65-75	$1.35
Pacific Coast	5.5	5.5	†0.85-95	‡0.80-85
Gulf Coast	4.0	.....	1.65	0.85

*36-40 gravity fuel oil. †Pacific specification 300. ‡Pacific specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—		
200-210 D, 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.50
Steam refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
630 flash	17.00	18.00

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.50
300-3½	20.50
600-3½	21.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	....
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	....
124-126 (A.m.p.) w.c. scale	....

Note: Most refiners are not quoting on wax pending interpretations of OPA order.

Neutral Oil

CALIFORNIA—		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		38.50
10 pour point		37.50
15 pour point		36.50
25 pour point		31.00
200 vis., at 70° F., 3 color:		
Zero pour point		40.50
10° pour point		39.50
15 pour point		38.50
25 pour point		33.00
NEW YORK—		
Wax in bags fully refined:		
130-132 (A.m.p.) wax		....
133-135 (A.m.p.) wax		....
Crude scale:		
124-126 (A.m.p.) w.s.		....
124-126 (A.m.p.) y.s.		....

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.500	6.250-6.500	5.875	5.625
Pacific Coast	.....	6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene	Diesel fuel				Bunker
	41-43	24 G.	48-52 D.I.	58 D.I.	Bunkers	C grade
Gulf Coast	4.000-4.250	.....	4.125-4.375	4.375	$1.65-80	$0.85-95
Pacific Coast	4.750-5.000	1.25-30	.....	....	1.35-45	*0.85-90

*Pacific specification 400.

Lubricating Oils

	Neutral oils		Bright and cylinder stocks		
	200-3	150-3	200-3	150-3	600&630 S.R.
Mid-Continent	16.8	.....	28.8	24.8	.....
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Baltimore, Md.	15.05	5.50	8.70
Boston, Mass.	14.00	4.50	8.00
Burlington, Vt.	16.00	5.50	8.30
Buffalo, N. Y.	15.30	5.50	8.30
Dover, Del.	15.80	5.50	10.50
Hartford, Conn.	14.70	4.50	7.60
Manchester, N. H.	16.40	5.50	9.00
Newark, N. J.	14.30	4.50	7.90
New York, N. Y.	15.20	5.50	8.00
Philadelphia, Pa.	15.30	5.50	10.15
Pittsburgh, Pa.	15.80	5.50	10.50
Portland, Me.	15.40	5.50	8.10
Providence, R. I.	14.10	4.50	7.80
Washington, D. C.	13.30	3.50	9.20
Average 14 cities	15.04	5.07	8.72

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Chicago, Ill.	14.10	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	11.90	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.25	8.00	8.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	15.00	7.00	8.00
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	14.90	5.57	9.44

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky and Louisiana)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Atlanta, Ga.	18.50	7.50	10.00
Birmingham, Ala.	19.00	8.50	9.00
Charleston, S. C.	18.05	7.50	....
Charleston, W. Va.	18.35	6.50	11.50
Charlotte, N. C.	19.20	7.50	9.50
Jacksonville, Fla.	18.50	8.50	8.00
Jackson, Miss.	18.00	7.50	9.00
Louisville, Ky.	17.00	6.50	8.50
Memphis, Tenn.	17.75	8.50	10.50
New Orleans, La.	17.75	8.50	*10.50
Norfolk, Va.	16.55	6.50	10.20
Average 11 cities	18.05	7.59	9.67

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	4.50	13.50
Average 3 cities	16.17	5.17	12.83
Average 50 cities	16.14	5.96	9.87
Average last week	16.03	5.96	9.86

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Geophysical Service

HOMER L. FITCH, GEOPHYSICIST AND OIL LOCATION ENGINEER, Drawer 711, Brownsville, Texas. SAVE money and materials by drilling only locations that will be producers. Capital needed to develop some of our best SHALLOW OIL STRUCTURES.

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BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo. Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma

Mailing Lists

ROYALTY owners, Oil investors, Unit holders, Stockholders, Operating personnel of oil industry, Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa, Okla.

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OUR READY MARKETS Enable us to pay cash for producing royalty acreage, lots, units and oil payments. GLOBE SECURITIES CO., LTD., Oklahoma City.

BUY RANCH Land under oil development R.M. area. Returns ⅛ royalty. 20 acres $135 or 40 acres $250. Write Box A-822, The Oil and Gas Journal, Tulsa.

SMALL amount of good producing royalty for sale in Kansas and Oklahoma City; priced to yield around 20%. R. M. Millard, Eau Claire, Wis.

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ROYALTY INTERESTS, under producing oil and gas-distillate properties, bought and sold. Inquiries and offerings invited. Accounts of registered dealers solicited. J. GOULD REAVES, REAVES BUILDING, TYLER, TEXAS.

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State Oil & Gas Leases
Harry S. Wright, Farmington, N. M.
REGISTERED ROYALTY DEALER

Incorporation

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G Guyer, Inc., Wilmington, Delaware

CAPITAL SEEKERS

Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD. Fox Theater Building, Detroit, Michigan

Ranches and Farm Lands

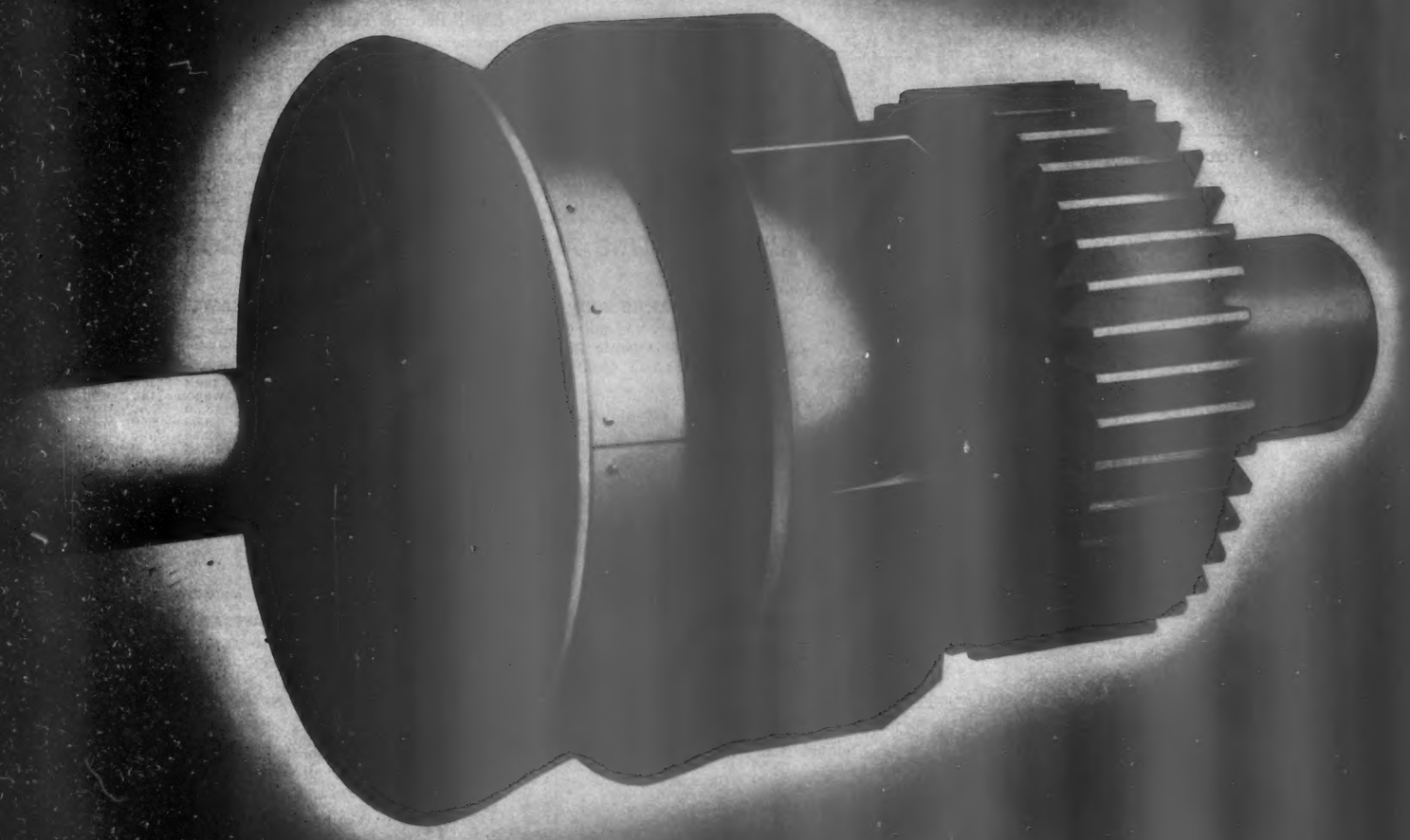
9000 AC. Ranch For Sale. Thirty miles north of Hugo, Oklahoma. All minerals intact. Plenty of water, lots of grass, rough land, good timber and game. There is Twenty Thousand Dollars worth of new improvements. Price is $4.75 per ac. C. O. WALLING, 214 W. 2nd St., Burkburnett, Tex.

Wanted

CRUDE OIL WANTED—Cash paid for crude oil from Oklahoma, Kansas, North Texas, Illinois, and Wyoming. Give amount available per day, field, pipeline connections, distance from pipe lines or railroads, formation, complete specifications, and price in first letter. Box A-844, The Oil and Gas Journal, Tulsa, Okla.

Additional Classified on Pages 238-39

Molybdenum Steels meet exacting service requirements without increasing costs



A considerable saving has been brought about by making the vital cone clutch in a draw works assembly of cast Manganese-Molybdenum steel.

This steel, containing 1.20%-1.50% Mn and 0.30%-0.40% Mo, develops ample strength and hardness when double normalized and tempered at 1200° F.

Without sacrifice of serviceability, costs have been reduced by adopting this steel, noted for its exellent physical property-cost ratio.

You will find the complete data on Molybdenum steels in our technical book, "Molybdenum in Steel", helpful. A copy will be sent free on request.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
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MOLY

EQUIPMENT PROGRESS...

Portable Unit Purifies Water Without Chlorine

A portable, automatic ozone water-purification unit, designed for oil-field use in all localities, has been developed by the Technicraft Engineering Co., a division of Lane-Wells Co., 5610 South Soto Street, Los Angeles, Calif. The unit, known as the Sterozone Model B, has a capacity in excess of 1,200 g.p.h. It can be installed in any tank or water-storage container or can be equipped with a 250-gal. canvas bag.

Sterozone Model B water purification unit set up with auxiliary supply unit and filter tanks

Power is supplied from a 110-volt, 50-60 cycle line or from an auxiliary portable gasoline-electric generator. Operation of the unit is entirely electrical. No chlorine or other chemical is needed. The sterilizing agent is ozone generated by a silent electrical discharge maintained at 11,000 volts. Injected directly into the water passing through the unit, the ozone completely oxidizes bacterial contamination and produces clear, pure, colorless, odorless, tasteless water.

Complete description, together with results of laboratory tests of water treated by the unit, is available from the manufacturer.

Wire Rope Electric Hoist Features Portability

The Speedway, a new light weight, compact, wire rope electric hoist, has been added to their present line by the Wright Manufacturing Division of the American Chain & Cable Co., Inc., Bridgeport, Conn.

The Speedway is obtainable in capacities from 250 up to 1,000 pounds. Portability, flexibility and accessibility are outstanding features, and it is like an electrical accessory, ready to go to work anywhere. It has push-button control, is weatherproof, acidproof, dustproof, has preformed hoisting cable on drum winding, safety limit switches, safety load blocks, and is furnished for lug, hook or trolley suspension, and for 110 or 220 volt single phase 60 cycle current; also for 220 or 440 volt 3 phase 60 cycle.

Steel Founders' Society Organizes for 1942

At the organization meeting of the new board of directors of the Steel Founders' Society of America held in New York, the following officers and directors were elected, appointed, or confirmed:

President, O. E. Mount, American Steel Foundries, Chicago, Ill.; vice president, L. C. Wilson, Reading Steel Casting Division of American Chain & Cable Co., Reading, Pa.; executive committee, Mr. Mount, Mr. Wilson, and C. L. Harrell, Sterling Steel Casting Co., East St. Louis, Ill.

Board of directors, Mr. Mount, chairman; Division 1, Mr. Wilson; Division 2, D. P. Murphy, Symington-Gould Corp., Depew, N. Y.; Division 3, Frank M. Robbins, Ross-Meehan Foundries, Chattanooga, Tenn.; Division 4, C. W. Howat, Continental Roll & Steel Foundry Co., Pittsburgh, Pa.; Division 5, F. K. Donaldson, Machined Steel Casting Co., Alliance, Ohio; Division 6, M. A. Fiadoes, Sivyer Steel Casting Co., Milwaukee, Wis.; Division 7, C. L. Harrell, Sterling Steel Casting Co., East St. Louis, Ill.; Division 8, N. K. Anderson, Alloy Steel & Metals Co., Los Angeles, Calif.

Alternate directors: Division 1, E. M. Schumo, Pennsylvania Electric Steel Casting Co., Hamburg, Pa.; Division 2, Ellis Hodge, Erie Forge Co., Erie, Pa.; Division 3, F. G. Russell, Florida Machine & Foundry Co., Jacksonville, Fla.; T. H. Shartle, Texas Electric Steel Casting Co., Houston, Tex.; Division 4, T. F. Dorsey, Fort Pitt Steel Casting Co., McKeesport, Pa.; Division 5, A. A. Stroppel, Sawbrook Steel Casting Co., Cincinnati, Ohio; Division 6, Carl Clarke, Monroe Steel Castings Co., Monroe, Mich.; L. J. Wise, Allied Steel Casting Co., Chicago; S. V. Wood, Minneapolis Electric Steel Castings Co., Minneapolis, Minn.; Division 7, F. G. Langbein, St. Louis Steel Castings Co., St. Louis, Mo.; Division 8, E. L. Knight, Pacific Car & Foundry Co., Seattle, Wash.; I. L. Johnson, Pacific Steel Castings Co., Berkeley, Calif.

Executive vice president, Col. Merrill G. Baker, S.F.S.A. headquarters, Midland Building, Cleveland, Ohio, and secretary-treasurer, R. L. Collier, S.F.S.A. headquarters.

TRADE LITERATURE

A. P. GREEN FIRE BRICK CO., Mexico, Mo.—A folder on Greencote, a refractory maintenance coating for reconditioning furnace linings, especially timely when all plant operators are faced with the problem of getting greater service from the furnace linings they already have.

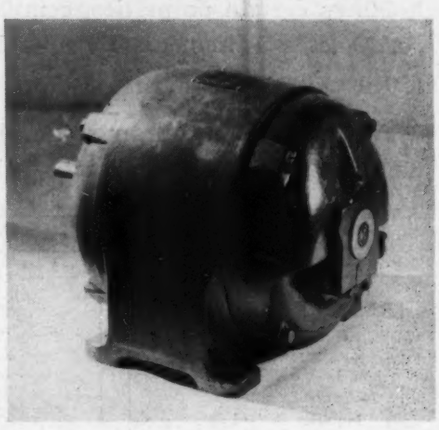
NORTON CO., Worcester, Mass.—"Grits and Grinds," current issue, which contains articles, well illustrated with photographs, on mechanical lapping and other subjects.

LANE-WELLS CO., 5610 South Soto St., Los Angeles, Calif.—The Lane-Wells Electrolog bulletin, completely revised and brought up to date, with a discussion on new services Lane-Wells is now in a position to make available to the oil industry. There is an interesting comparison of electrolog and radioactivity log curves, showing the correlation of the two types of curve made in uncased and cased hole. Also, the Quinta-Seat packer and liner hanger bulletin, containing up-to-date engineering information on the use of these specialized tools.

Motor Has All-Around Safety Protection

"The greatest motor improvement in years" is how Allis-Chalmers, Milwaukee, Wis., describes the Safety-Circle protection of its new Lo-Maintenance motors. Specially developed to give the motor complete all-around protection, the Safety-Circle is a wide, solid rib, integrally cast as part of the frame, which forms an unbroken circle of protection around the stator.

All the experience of building motors for over 50 years has been concentrated in the development of this advanced product. One-piece cast frame and cast end-shields guard the motor from exterior knocks and abuse. A more liberal use of electrical materials makes this motor internally and electrically stronger because current and magnetic densities are less extreme.



Improved bearing design delivers smoother performance with full-flow lubrication and easier maintenance. Additional cross strength has been built into the distortionless stator for maximum power efficiency. Rotor is keyed to the shaft for strength, and its outer surface is turned for smoothness and an accurate air gap.

Heavier Lips Added to Drill-Pipe Protectors

Following the introduction several months ago of lips to rubber protectors for drill pipe and casing, Patterson-Ballagh Corp. announces an improvement.

The addition of lips to the ends of protectors has proved so successful that it was deemed advisable to increase the cross area of same. The newest type of protectors introduced recently by Patterson-Ballagh include heavier lips.

The cause of notch fatigue failure is the occurrence of a circumferential groove, or grooves, occurring on the pipe at the ends of protectors, and in order to avoid any possibility of grooving, the lips were added. The occurrence of grooves is from corrosion, probably due to fluid being held at the corner while the pipe is standing in the derrick.

CLASSIFIED ADVERTISING

THE MARKET PLACE OF THE OIL INDUSTRY . . .

Leases and Drilling Blocks

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We own properties in California, Illinois, Indiana, Kansas, Louisiana, Nebraska, Oklahoma, Texas.

All of our properties have been broadly classified for oil possibilities by DeGolyer, MacNaughton and McGhee of Dallas, Texas. This outstanding firm of geologists have selected from our total holdings certain properties, comprising more than 50,000 acres, as immediately suitable for oil and gas prospecting.

We invite inquiry from responsible drillers. Address P. O. Box 177, Cincinnati, Ohio.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

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PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois
20 Years Experience
Inquiries Invited
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Paul Brown Bldg., St. Louis, Mo.

FOR SALE: Oil and gas leases, small production, drilling propositions, fluorspar and rock asphalt deposits. Reports and maps furnished on request. W. P. Harley, Bowling Green, Ky.

WESTERN Kans. & Eastern Colo. 100-000 acres for lease or sale. Terms. Write Owner, John W. Baughman, Liberal, Kans.

THE
OIL PROPERTIES EXCHANGE
For Sale: Many Producing Oil Properties, Royalties, Drilling Blocks, and Oil Investments of various sizes in Mid-Continent area. Contact us to Buy or Sell properties.
Alexander Bldg., Tulsa, Okla.

CONTROL offset McClosky production. 120-acre lease, 7/8 oil and gas, Wayne County. Devonian test, and $1,000 Cash. 2,000-acre block Edgar County, 1,000 acres Coles County, and 1,000 acres Cumberland County, want test. S. J. Burkitt, Mowequa, Illinois.

FOR SALE: 22 old, 1000 ft. wells, 5 powers etc., lease 700 acres, Jay Co. Indiana, 4326 Buell Dr., Fort Wayne, Ind.

FOREST City Basin, 3,000-acre block, near McLouth; Will farm out. Harry Haynes, Grantville, Kansas.

REAL bargains for 1942 in Shelby County leases: 10 acres, ½ mile from production, $10 per acre. 50 acres semi-proven, in Joaquin field, $5 per acre. 26½ acres ½ mile from production. Write for price. Also 5000-acre block with good geology. Write for details.
C. A. PARKER
Box 451, Center, Texas.

OIL OPERATORS ATTENTION: 10,000 acre drilling block R.M. area, Shallow and deep oil. Will deal for drilling percentage. Box A-823, The Oil and Gas Journal, Tulsa.

ABOUT 3,000 acres of oil leases open to drill for acreage, good possibilities. Philo Dempsey, Roosevelt, Okla.

Patent Attorneys

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All cases submitted given personal attention.
Form "Evidence of Conception" with instructions for use and "Schedule of Government and Attorney's Fees"—FREE.
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418 Bowen Bldg., Washington, D. C.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Equipment Wanted

HIGHEST cash prices paid for entire plants or individual production tools, milling machines, shapers, drill-presses, lathes, punch presses, electrical equipment and motors. Write us and a representative will call. COOK COUNTY MACHINERY CO., 1132 W. Lake St., Chicago, Ill.

CA H for your surplus mechanical or pressure steel tubing, pipe, boiler tubes, used or new, regardless of quantity and location. Send us your list of surplus valves, fittings, tools and supplies you have for sale. Quinn & Co., Box 4503, Atlanta, Georgia.

WANTED—Used Oil Country boilers. Write us giving complete specifications, condition and location. Lucey Products Corp., Tulsa, Okla.

Situations Wanted

OIL Experienced Male Secretary, Stenographer, age 29, draft classification II-A, now employed, wishes change. Experience includes oil refining and production, land leases, traffic, sales promotion, collection. Can manage all details of office routine. Prefer capacity as private secretary. Can go anywhere and will travel. Salary discussed in correspondence or interview. Please reply to Box A-832, The Oil and Gas Journal, Tulsa, Okla.

PETROLEUM and PRODUCTION ENGINEER; age 29; seven years with major oil company, four years as district head. Forced to terminate present private business venture due to shortage of materials. Desire connection with a progressive oil company in need of an experienced engineer. Box A-851, The Oil and Gas Journal, Tulsa, Okla.

Help Wanted

DESIGNERS AND DRAFTSMEN

For Oil Refinery work carrying high priority ratings of A-1-A and A-1-B under
Government Defense Program
Must have experience in design of:
Oil Refinery Process Piping, Concrete and Structural, Oil Heating Furnaces, Pressure Vessels, Electrical Control and Light and Power Conduit Systems.
Can use several piping squad leaders. Must be thoroughly experienced.

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MANUFACTURERS' Representatives known to the best oil field trade desired for quality specialties now being sold to the best oil field trade, repeat items, excellent commissions, exclusive territories open. Box A-811, The Oil and Gas Journal, Tulsa, Okla.

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WANTED: Experienced laboratory control operator for handling routine tests and controls. State experience and qualifications. Answers will be held confidential. Address Box A-841, The Oil and Gas Journal, Tulsa, Okla.

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PIPING DESIGNERS
AND DRAFTSMEN
Experienced in the layout and detailing of piping for oil refinery units, processing plants, or chemical plants.

STRUCTURAL DESIGNERS
AND DRAFTSMEN
Experienced in design and detailing of steel structures, foundation and concrete work, and industrial buildings.

PROCESS EQUIPMENT
DESIGNERS AND DRAFTSMEN
Experienced in design of pressure vessels, fractionating columns, heat transfer equipment, and the like.

ELECTRICAL ENGINEERS
Experienced in electrical layout for process plants. Must know explosion proof work.

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Experienced in preparation of specifications for purchase and preparation of bills of material for process plant construction work.

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1—Parkersburg SC-11 Pumping Unit, stroke range from 60 to 132".

GREENSPON'S
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Additional Classified on Page 235